

CAR DRIVER

PORSCHE

CAYMAN

INTELLIGENCE. INDEPENDENCE. IRREVERENCE.

IS THE BEST
PORSCHE A
CAYMAN?

*We shake down
the 493-hp GT4 RS
to find out whether
it has eclipsed
the 911.*

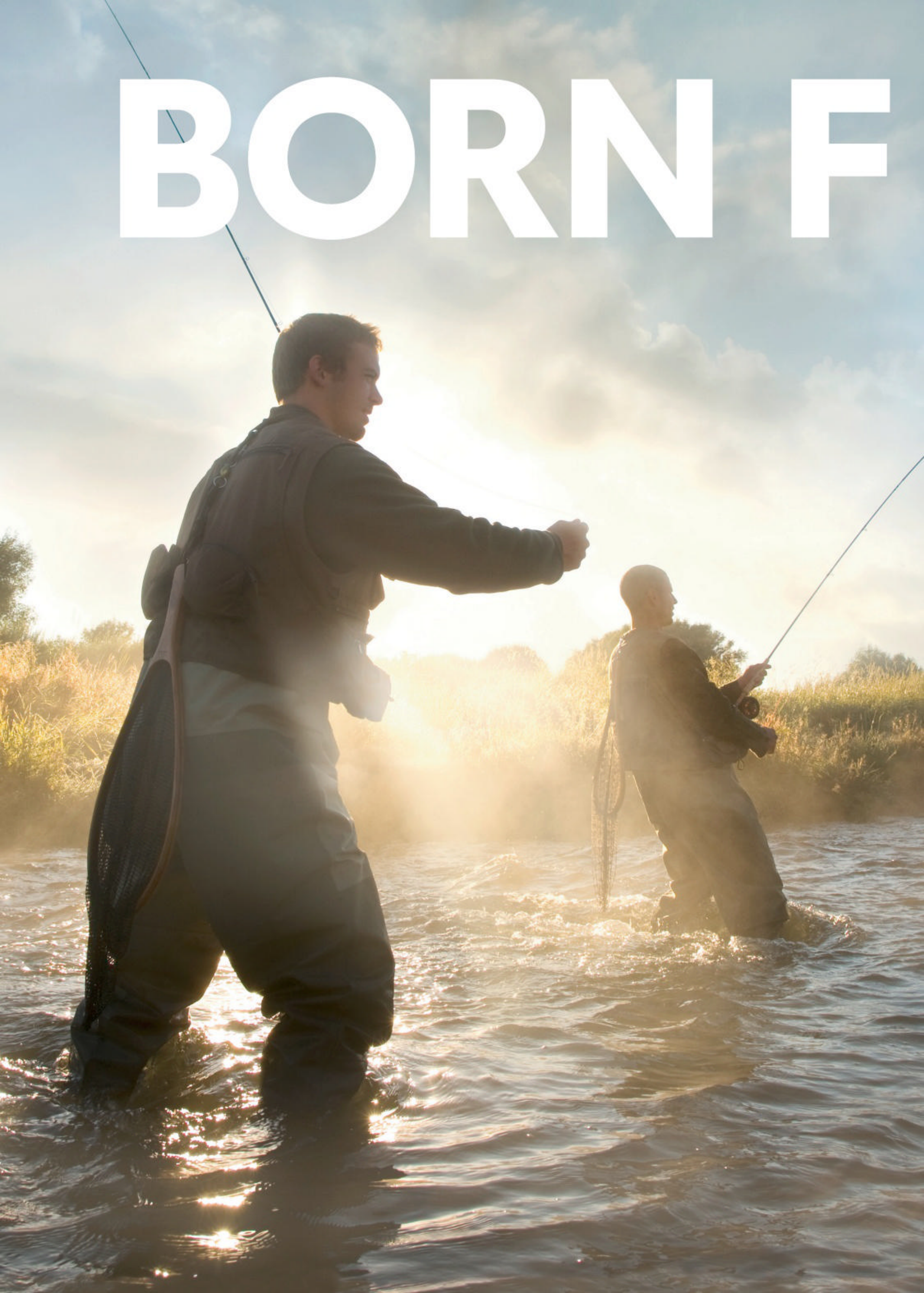


GT4 RS

PLUS

TO SEPARATE FACT FROM FICTION, WE TEST A TESLA MODEL 3 FOR TWO YEARS AND 40,000 MILES
LOADED QUESTION: FOR \$26,000, SHOULD YOU BUY A FORD MAVERICK OR A HONDA CIVIC?
THE NEW GENESIS GV70 FACES OFF AGAINST ESTABLISHED PLAYERS TO SEE WHERE IT FITS
WHAT WILL HAPPEN TO TODAY'S POWERTRAIN ENGINEERS IN A BATTERY-POWERED FUTURE?

BORN F



OR THIS



THE ALL-NEW
TUNDRA

Prototype shown with options. Off-roading is inherently dangerous. Abusive use may result in bodily harm or vehicle damage. Wear seatbelts at all times and do not allow passengers in cargo area. Properly secure all cargo. ©2022 Toyota Motor Sales, U.S.A., Inc.

Progressive Casualty Ins. Co. & affiliates. Coverage subject to policy terms.

YOUR BOSS'S RETIREMENT PARTY

Protect your escape with Progressive.

Progressive knows that the best part of any event is leaving on your bike. That's why we offer comprehensive and collision coverage for your bike and more.

See if you could save by switching to America's #1 motorcycle insurer.



PROGRESSIVE

28

TESTED

2022 Porsche 718 Cayman GT4 RS

Porsche's famous GT division created the 718 Cayman GT4 RS. We pit it against one of SoCal's finest dead-end roads.

By Dan Edmunds

34 . TESTED

2022 Porsche 911 GT3

It may share an engine with the GT4 RS, but a manual GT3 is proof that getting involved is better than worshipping numbers.

By Ezra Dyer

36

COMPARISON TEST

Challenging the Establishment

BMW X3 M40i vs. Genesis GV70 3.5T Sport AWD vs. Lexus RX350 F Sport AWD.
By Mike Sutton

44

FEATURE

Work Shift

How will a battery-powered world affect automotive engineers?

By Greg Fink and Elana Scherr

48

THOUGHT EXERCISE

Buying Culture

Does the Ford Maverick make small cars obsolete? We compare it with a 2022 Honda Civic Sport to find out.

By Ezra Dyer

56

LONG-TERM TEST

2019 Tesla Model 3

Beyond the noise. It takes us two years, but we go 40,000 miles in a car that appears to be the future.

By Dave VanderWerp

"THE GT3 IS ITS OWN EXCLUSIVE CLUB, AND THE MANUAL GT3 IS THE ROPED-OFF VIP AREA INSIDE THAT."

—Ezra Dyer, "Grün with Envy"

CATCH EVERY IMSA RACE LIVE ON THE NBC FAMILY OF NETWORKS



**MID-OHIO SPORTS
CAR CHALLENGE**

MAY 13-15

**CHEVROLET DETROIT
GRAND PRIX PRESENTED
BY LEAR**

JUNE 3-4

YOUR SPRING RESET

Give your vehicle some TLC this spring with WeatherTech's line of premium products. FloorLiner HP helps ensure a pristine interior regardless of the forecast, while SunShade acts like a pair of sunglasses for your car or truck.

**So stay cool and find everything you need to freshen up
your ride at [weathertech.com](https://www.weathertech.com).**



© 2022 MacNeil IP LLC



FLOORLINER™ HP



SUNSHADE

WeatherTech®.com
Auto. Home. Pet. Find Your Fit. 1-800-441-6287

LIVE THE DRIVE. JOIN THE CLUB.

THE TRACK CLUB

POWERED BY

ROAD
TRACK

CAR AND DRIVER

Autoweek

BRING A TRAILER

BECOME A MEMBER FOR:

- // Invites to join *Road & Track* and *Car and Driver* editors on tracks around the U.S.
- // Priority registration to Road & Track Experiences
- // Invites to exclusive virtual conversations and epic automotive events with editors and special guests
- // Recognition on the Founders' page in the magazine and online
- // Perks from travel, luxury, and auto partners plus offers from Bring a Trailer auction site
- // Premium welcome box filled with exclusive Track Club gear
- // So much more



ROADANDTRACK.COM/TRACK-CLUB
← OR SCAN HERE

TABLE OF CONTENTS MAY 2022



COLUMNISTS

- 12. Tony Quiroga**
Motown hits.
- 24. Ezra Dyer**
Sound opinions.
- 26. Elana Scherr**
MMMBop appreciation.

UPFRONT

- 15. Lotus Operandi**
This time the British brand has money.
- 18. Missed Signals**
Is your car actively helping you drive?
- 20. When Animals Attack . . . or Snack**
The world's wildest insurance claims.
- 22. Bright Idea**
Adaptive headlights may get switched on.

THE RUNDOWN

- 64. 2022 Acura NSX Type S**
Closing time.
- 68. 2023 Nissan Ariya**
Turning over.
- 70. 2022 Acura MDX Type S**
Great aspirations.
- 72. 2022 BMW iX xDrive50**
Sartorial utility vehicle.
- 74. 2023 Subaru Solterra**
EV meets ORV.
- 75. 2022 Subaru WRX Limited**
Last shot at love?
- 76. 2022 Buick Enclave Avenir AWD**
Dear Buick.
- 78. 2022 Lincoln Navigator**
The big glide.

ETC.

- 7. Backfires**
10Best whiners and some painful wordplay.
- 80. Buick Roadmonster**
Making a giant run proves hilarious.



Backfires

The joyful noise of the commentariat, rebutted sporadically by Ed.

STARTING IN

I got a kick out of the January 2022 cover saying, "No need to write a letter. We count 11 as well." As if the magazine needs more letters to the editor. Aren't the letters the bread and butter of *C/D* these days?

—Hans Groenewold
Rio Rancho, NM

The 10Best list is like the automotive baker's dozen. Sure, they can't count, but who doesn't love an extra pastry?

—Zach Lashley
Denver, CO

As I stood looking at the cover of your 10Best issue, I realized the blue color of

the text almost matched the color of the water. With another two flushes, it lightened to be an exact match! Don't cancel my subscription.

—Bob Pentecost
Boise, ID

This issue provided a delightful experience. The descriptions of the 10Best cars made me feel as if I knew and understood them completely. I admire your writers' talent and effort.

—Pat Lovett
Carmel, IN

Calling Tesla on their BS, a tow rating for an SUV, Porsches. If there were an adequate number of McLarens in this issue,

I'd think you're actually reading my letters!

—Cameron Brown
Mooresville, NC

Just this one—Ed.

ARTIST EYES

I have been a faithful *Car and Driver* reader since the '70s. Your 10Best issue has long been my favorite, but the January 2022 issue was the worst ever. First, there's too many crazy comic-book graphics. Look at the "Legends of Performance" two-page intro for the Porsche 718 and the Volkswagen GTI. WTF! This space could have been given to pics of previous models or a summary of past performance data for comparison. Or even more

CUSTOMER SERVICE Call 800-289-9464, email cdbsCustServ@CDSFulfillment.com, visit www.caranddriver.com/service, or write to Customer Service Dept., *Car and Driver*, P.O. Box 37870, Boone, IA 50037 for inquiries/requests, changes of mailing or email addresses, subscription orders, payments, etc.

CAR AND DRIVER® (ISSN 0008-6002), VOL. 67, NO. 9, May 2022, is published monthly, 10 times per year, with combined issues in February/March and July/August, by Hearst, 300 West 57th Street, New York, NY 10019, U.S.A. Steven R. Swartz, President & Chief Executive Officer; William R. Hearst III, Chairman; Frank A. Bennack, Jr., Executive Vice Chairman; Debi Chirichella, President, Hearst Magazines Group. Hearst Autos, Inc.: Nick Matarazzo, President & Chief Revenue Officer; Debi Chirichella, Treasurer; Catherine A. Bostron, Secretary. © 2022 by Hearst Autos, Inc. All rights reserved. Trademarks: *Car and Driver* is a registered trademark of Hearst Autos, Inc. Periodicals postage paid at New York, NY, and additional mailing offices. Canada Post International Publications mail product (Canadian distribution) sales agreement no. 40012499. Editorial and Advertising Offices: 1585 Eisenhower Place, Ann Arbor, MI 48108. **SUBSCRIPTION PRICES** United States and possessions: \$13.00 for one year; Canada, add \$10.00; all other countries, add \$24.00. **SUBSCRIPTION SERVICES** *Car and Driver* will, upon receipt of a complete subscription order, undertake fulfillment of that order so as to provide the first copy for delivery by the U.S. Postal Service or alternate carrier within 4-6 weeks. **MAILING LISTS** From time to time, we make our subscriber list available to companies who sell goods and services by mail that we believe would interest our readers. If you would rather not receive such offers by postal mail, please send your current mailing label or an exact copy to Mail Preference Service, P.O. Box 37870, Boone, IA 50037. You can also visit preferences.hearstmags.com to manage your preferences and opt out of receiving marketing offers by email. *Car and Driver* assumes no responsibility for unsolicited material. None will be returned unless accompanied by a self-addressed stamped envelope. Permissions: Material in this publication may not be reproduced in any form without permission. Back Issues: Back issues are available for purchase in digital format only from your app store of choice. **POSTMASTER** Send all UAA to CFS. (See DM 507.1.5.2); **NON-POSTAL AND MILITARY FACILITIES** Send address corrections to *Car and Driver*, P.O. Box 37870, Boone, IA 50037. Printed in the U.S.A.



Backfires

Superheroes seem to be everywhere these days, including in this magazine.



pictures of the cars! This is repeated throughout the magazine—cartoons when we coulda had pictures or, better yet, words. Second, I really wanted to read about the Kia Telluride, but the faded-gray type was nearly indiscernible. WTF!

—Tom Cartwright
Las Vegas, NV

What is the deal with putting text in light gray on the Ram 1500's 10Best entry?! It's not cool. It just makes me have to hold it at funny angles to read it. Stop it! (I just had my 40th birthday. I'm practic-

ing my griping.) Otherwise, keep up the good work.

—Prescott Thompson
Albuquerque, NM

The art department would like to know if this color is easier to read—Ed.

Sorry, but the cartoon-like illustrations for 10Best were juvenile and a waste of 10 and a half pages. Photographs of the best cars and trucks would be a much better use of that space.

—Lance MacNevin
Ashburn, VA

We had photos last year, and we got complaints—Ed.

TAKE YOUR CUTS

I have always felt that once you get your Mach-E, you take your Mach-E auto to Starbucks and get a macchiato ["Half-Full Fridge," January 2022].

—John Calvert, Salinas, CA

Swing and a miss—Ed.

Since the Mach-E Mustang isn't really a Mustang, maybe it should be called the Mock-y Mustang instead.

—Jim Heldberg, Pacifica, CA

Foul tip. Strike two—Ed.

If Ford exports the new Mach-E to Italy, will it be called the Mach-E-Vellian?

—Tim Geahan, Grand Rapids, MI

Ball, outside—Ed.

LETTER
OF THE
MONTH

Any word on the de Sade package for the Mach-E? If you don't find that hilarious, you can just cancel my subscription!

—Eric Howell, Urbandale, IA

Going, going, gone! And, the scale-model

Acura NSX goes to Howell, for his painful wordplay—Ed.



PRICE SHOPPERS

I love the Cadillac CT5-V Blackwing ["The League of Extraordinary Sedans," January 2022]. I was even more impressed to read that it's \$40,000 cheaper than the BMW M5 CS. Unfortunately, I looked at all available CT5s for sale, and they were priced at, or over, \$140,000. As usual, GM kills the dream as soon as it got good.

—Randy Zussman
Lost Wages, NV

Don't blame GM. It's the dealers killing the dream—Ed.

Some of us cannot afford a new Blackwing. You mention that the CTS Vsport previously made the 10Best list. How about a review of the "best buy" used 10Best winners?

—Jim Ashworth
Westminster, CO

You should always seek out 10Best winners, new or used. Except maybe the '83 Alliance. Maybe—Ed.

"Buying this car says you understand and know the difference between what has a good reputation and what's actually good." That's a great sentence about a car I will look for on the off-lease lots in three years. Six-speed, natch. If only GM could build a great car before the end of days.

—Andrew Gibson
Savannah, GA

This is how it's done, Ashworth—Ed.

DEAL OR NO DEAL

Please, when praising the Corvette Stingray and its affordability, mention that dealers are adding \$15,000 to \$40,000 to the sticker, making the car *not* affordable, and now orders are being taken for the '23 model ["Greatest American Hero," January 2022].

—W.W. Raulerson
Trent Woods, NC

Hey, everyone, we forgot to mention that capitalism exists—Ed.

FORDLANDIA

I emailed you a year ago to say that vehicles that take 200 feet or more in your 70-to-zero-mph braking test should not be on your 10Best list. Obviously, you didn't agree. The Bronco's 217 feet from 70 mph is inexcusable ["Squared Up," January 2022]. And the dismal 0.71 g in roadholding is scary. These figures should make it ineligible for your 10Best list.

—John M. Duryee
Cranford, NJ

The Bronco isn't a sports car, so it's not judged as one. But in the right hands, the Bronco's braking and roadholding are sufficient—Ed.

It's funny how hard Ford is working to distance itself from the white Ford Bronco of yesteryear. I've yet to see a press photo or a review of a new one in Oxford White.

—Ben Locwin
Andover, MA

MDX

PRECISION CRAFTED PERFORMANCE



*Type***S**

*Type***S**

*Type***S**

THE LINE OF TYPE S PERFORMANCE VEHICLES BRINGS A NEW LEVEL OF POWER AND PRECISION TO THE PAVEMENT. THE MDX TYPE S HAS HAD EVERY DETAIL THAT MATTERS TO THE DRIVER RETUNED. FEATURING A 3.0L TURBO V-6, SUPER HANDLING ALL-WHEEL DRIVE,[™] AND ALUMINUM DOUBLE-WISHBONE FRONT SUSPENSION, IT'S ENGINEERED TO BE THE MOST THRILLING SUV IN ACURA HISTORY.

 **ACURA**



▶ **アキュラ**



Backfires

While the 10Best package drew criticism for its lack of photography, the Maverick photos were praised.

Did Ford tell you what to say about the Bronco in your 10Best story? It reads like a Ford Motor Company marketing piece through and through. And then you pick the Honda Accord for the nth time. Seriously? That car has all the appeal of a suckled mango pit. This reminds me why I'm letting my subscription expire.

—Aldo Martin
Bellingham, WA

I'm running this letter only because it led me to Google "suckled mango pit," and now all of you should too—Ed.

WINNING AND LOSING

Curious as to why the Hyundai Palisade wasn't included in 10Best, as it is a pretty close twin of the Kia Telluride ["Three-Row Hat Trick," January 2022].

—Jeff Terito
Oviedo, FL

Pretty close isn't close enough—Ed.

Just wanted to confess that every time I see a Telluride, I want to rush up to the driver and say, "I can tell you ride a Kia!" Fortunately, so far, I have been able to restrain myself. Oh, right: Car and



Driver is irreverent—not able to hear confessions.

—Jeff Ratner
Soquel, CA

PHOTO GALLERY

Hey, I enjoy interior pics as much as the next guy, especially of what appear to be plaid seats in the GTI ["Box of Joy," January 2022]. But c'mon, how about some decent exterior shots

of cars on the 10Best list? Did you run out of film cartridges for your Polaroid?

—Matt Casto
Lebanon, TN

Supply-chain woes meant we couldn't get discs for our Kodak disc cameras—Ed.

PICKING UP

Regarding the Ram 1500 10Best award, I'm curious as to which model gets 26 mpg combined and 10 mpg in the city ["Have It Your Way," January 2022].

—John Snyder
Newbury Park, CA

Per the EPA, the diesel-powered Ram 1500 HFE gets 26 combined (23 city and 33 highway), and the TRX gets 10 city—Ed.

MINI-TRUCKIN'

I was struck by Marc Urbano's picture on page 50 of a crisp and clear Ford Maverick in front of a blurry Ford plant in Detroit ["Just Enough Truck," January 2022]. Was that a digital composite of two shots? Or was it practical, with the photographer perfectly matching speeds with the vehicle in motion? It made me wonder about the process.

—Ken Molay
Cary, NC

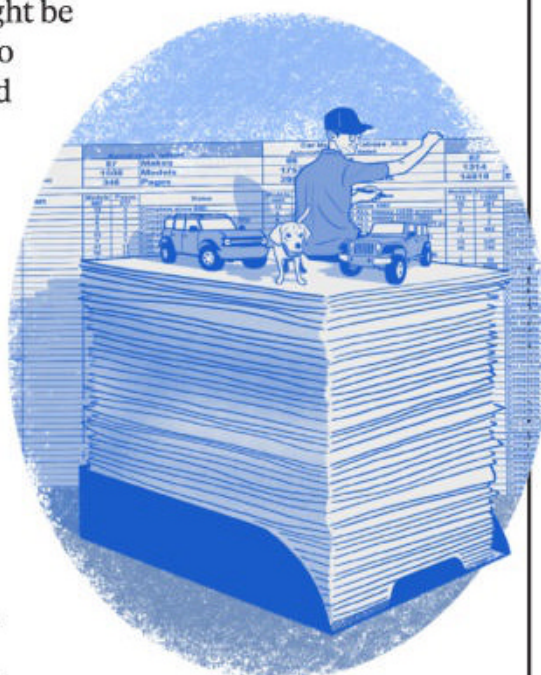
It's a single panning shot. We drive around the same corner what feels like a million times, and Urbano tracks the car to get the shot. There are 10 or more blurry ones for every sharp one—Ed.

EXPLAINED

Decades ago when *C/D* introduced "results tallies," I sent you a letter to complain that you'd overwhelm a dozen objective elements with one massive subjective ranking, spoiling the outcome like a turd in a punchbowl. So seeing the Bronco-versus-Wrangler tallies brings back memories ["Mud and Guts," December 2021]. You cite "objective scores" on "features/amenities" with a score of 10 to 1. To call that anything but a big subjective swing vote is completely whacked unless, as my math professor once insisted, you can show your work. A tenfold order of magnitude on two very comparable trucks? Is it the Jeep's manual transfer-case lever? Or its live front axle? Maybe your algorithm carried over from a minivan comparison?

—Dean Pepperine, Ferrisburgh, VT

We unfortunately aren't going to show our work, because while you and your math teacher might be the only two outside our tech department who consider 200-plus rows of spreadsheet "a good read," Ed. says it isn't. We go through our lengthy checklist and verify every feature, from sliding sunshades to seatbelt valets to Apple CarPlay and Android Auto capability. The list changes with the times as amenities debut or become obsolete, so you won't see Dolby noise reduction anymore. Bottom line, the Wrangler we rented for the comparison was downright spartan next to the Bronco. This puts the price into perspective, as the extra \$5685 for the Bronco buys a ton of additional features, including power leather seats, automatic climate control, SiriusXM radio, a Wi-Fi hotspot, and navigation. —K.C. Colwell



CRIS CARTER
HALL OF FAME
FOOTBALL PLAYER

SKECHERS® WORKOUT WALKER™

FEATURES

ARCHFIT™

GOODYEAR®
PERFORMANCE OUTSOLES

SKECHERS.
hyper  burst
CUSHIONING

PREMIUM
PERFORMANCE
INSOLE



CARBON
INFUSED
FOREFOOT PLATE

DESIGNED TO PUT MORE SPRING IN YOUR STEP.

MAKE WALKING YOUR WORKOUT

GOODYEAR (AND WINGED FOOT DESIGN) AND BLIMP DESIGN ARE TRADEMARKS OF THE GOODYEAR TIRE & RUBBER COMPANY USED UNDER LICENSE BY SKECHERS USA, INC., MANHATTAN BEACH, CA. COPYRIGHT 2021 THE GOODYEAR TIRE & RUBBER COMPANY. THIS OR ANY FOOTWEAR CANNOT COMPLETELY ELIMINATE THE RISK OF SLIPPING.

SKECHERS.COM



I think the Ford Escape is very attractive and the right size. Please use the motor and drive-train from the new Maverick and price this SUV below \$30,000. Rule that market segment.

—Bill Robinson
Oklahoma City, OK

Ford is already attempting your product-planning idea with the current Escape, and while it's selling well, it's not quite ruling the segment—Ed.

WEARING PLAID

The Tesla Model S Plaid comes with half a steering wheel ["Time Machine," January 2022]. What's it for? Don't Teslas steer themselves? Oh, maybe they want you to think it's an F1 car.

—Jay Read
Green Valley, AZ

Zero to 60 in two seconds and hours to charge. Fuhged-aboudit. The more you write on EVs, the less interest there is in reading your magazine.

—Eric Weitze
Jupiter, FL

Tesla says that on a 250-kW Supercharger, its cars can gain 200 miles of range in 15 minutes—Ed.

BIG-TRUCK DRIVER

Toyota waited since 2007 to produce a new Tundra ["Big Truck, Big Wait," January 2022]. And the best they could do is copy Ford's EcoBoost 3.5-liter engine and 10-speed, Ram's coil-spring rear suspension, and GM's "styling"?

—Rick Manna
Lords Valley, PA

All in one convenient place—Ed.

Hurray for the new Tundra! Finally something uglier than the pig-snout BMWs! Bravo!

—Deck Robblee
Exeter, NH

MOTOWN HITS

A move to Michigan is happening. But first, California's gravity will tug on me, making escape difficult. The Golden State is seductive, and pulling away from its warm embrace isn't easy. In addition to my adopted home's sunny climate, I'll lose the uplifting San Gabriel Mountains, the Pacific's calming flat affect, and the joy of living 15 minutes from the Angeles Crest Highway. But it's better to focus on things I won't miss. Near the top of that list is having to smog my cars every two years.

Over the past decade, California's emission-testing requirements have served as guardrails keeping me from straying into automotive weirdness. Vehicles from eight years old all the way back to 1976 have to be tested, which can be too high a hurdle for cars built through the mid-'80s to clear. As much as I've wanted a big American car from that era, the thought of feedback carburetors and early emission controls struggling to pass an exam they didn't study for would've caused sleepless nights. I'll snooze right through my alarm in Michigan. The Mitten State ceased emission testing back in 1995, which means it's time for a mind-expanding purchase.

Up first: the last of the giants, the lightly sprung, 8-mpg, 25-hp-per-liter, 18-plus-foot sofas on 15-inch wheels that were the last gasp of postwar optimism—cars so perfectly conceived for the broken streets of southeastern Michigan that their existence outside the pleasant peninsula is confounding.

If this sounds like a Michigan-induced psychotic break, my answer is, maybe? I've never bought an automatic. I own two sports cars with 89.2- and 89.4-inch wheelbases, or about the size of a '70s personal luxury car's door. If psychoanalysis has taught me anything, it's that obsessions begin in childhood, and in my formative years, a '76 Cadillac Eldorado convertible lived in the garage. However, my current fixation to wear automotive bell-bottoms is the fault of the Rare Classic Cars & Automotive History channel on YouTube.

CFO by day and YouTuber by night Adam Wade runs the channel, which features domestic luxury cars from the '60s, '70s, and '80s. Watch a few videos and get pulled into Wade's world, where forgotten giants are celebrated and revered. You'll find yourself speaking knowledgeably about Carter carbs and the model-year changes of the first-gen Cadillac Seville. Don't think you want a '77 Mercury Marquis? Check in with me after you watch.

To get the chrome monkey off my back, I'm looking for a '76 Eldorado rag-top and its Lincoln analogue, the 1977–79 Mark V. Fortunately, our staff is also on YouTube, in a podcast-like series called *Window Shop*, where we compete to find cars to buy to meet a challenge. Check it out to see whether we can find me the right car. And if you've ever wondered what it's like to work at C/D, *Window Shop* pretty much provides the experience.

TONY QUIROGA
EDITOR-IN-CHIEF



PHOTOGRAPH BY MICHAEL SIMARI

Editor-in-Chief Tony Quiroga

Digital Director Laura Sky Brown • **BUYER'S GUIDE Deputy Editor** Rich Ceppos **Senior Editor** Drew Dorian • **FEATURES Senior Editors** Greg Fink, Elana Scherr **Staff Editor** Austin Irwin • **NEWS Senior Editor** Joey Capparella **Senior Associate Editor** Eric Stafford **Staff Editor** Caleb Miller **Social Media Editor** Michael Aaron • **REVIEWS Deputy Editor** Joe Lorio **Senior Editors** Ezra Dyer, Mike Sutton • **TESTING Testing Director** Dave VanderWerp **Deputy Director** K.C. Colwell **Technical Editors** David Beard, Dan Edmunds **Associate Technical Editor** Connor Hoffman **Road Test Editor** Rebecca Hackett **Road Warriors** Jacob Kurowicki, Christi VanSyckle • **CREATIVE Director** Darin Johnson **Consulting Designer** Pete Sucheski **Staff Photographers** Michael Simari, Marc Urbano **Photo Assistant** Charley M. Ladd **VIDEO Deputy Editor** Carlos Lago **Producer/Editor** Alex Malburg • **PRODUCTION Director of Editorial Operations** Heather Albano **Copy Chief** Adrienne Girard **Associate Managing Editor** Jennifer Misaros **Production Manager** Juli Burke **Copy Editor** Chris Langrill **Online Production Designer** Sarah Larson **Online Production Assistant** Andrew Berry **Editorial Assistant** Carlie Cooper • **CONTRIBUTORS European Editor** Mike Duff **Contributing Editors** Clifford Atiyeh, Brett Berk, Sebastian Blanco, Csaba Csere, Malcolm Gladwell, John Pearley Huffman, Andrew Lawrence, Bruce McCall, Jens Meiners, Jonathon Ramsey, James Tate, John Voelcker

Editorial Office 1585 Eisenhower Place, Ann Arbor, MI 48108

PRINTED IN THE U.S.A.

Editorial Contributions Unsolicited artwork and manuscripts are not accepted, and publisher assumes no responsibility for return or safety of unsolicited artwork, photographs, or manuscripts. Query letters may be addressed to the Editors.

Publisher and Chief Revenue Officer Felix DiFilippo

Vice President, Sales Cameron Albergo • **NEW YORK Group Sales Director** Kyle Taylor **Senior Sales Director** Joe Pennacchio **Sales Director** Shannon Rigby **Sales Manager** Richard Panciocco **Assistant** Keierra Wiltshire • **CHICAGO Sales Director** Rick Bisbee **DETROIT Group Sales Director** Samantha Shanahan **Sales Directors** Tom Allen, Deb Michael **Sales Manager** Chris Caldwell **Assistant** Toni Starrs • **LOS ANGELES Senior Sales Directors** Lisa LaCasse, Lori Mertz, Susie Miller, Anne Rethmeyer **Sales Director** Molly Jolls **HEARST DIRECT MEDIA Vice President** Christine Hall **Sales Manager** Celia Mollica **PRODUCTION Manager** Chris Hertwig **CIRCULATION Vice President, Strategy and Business Management** Rick Day

Published by Hearst 300 W. 57th Street, New York, NY 10019

President & Chief Executive Officer Steven R. Swartz **Chairman** William R. Hearst III

Executive Vice Chairman Frank A. Bennack, Jr.

President, Hearst Magazines Group Debi Chirichella

HEARST AUTOS, INC. President & Chief Revenue Officer Nick Matarazzo

Treasurer Debi Chirichella **Secretary** Catherine A. Bostrom **Chief Brand Officer** Eddie Alterman **Chief Marketing Officer** Michelle Panzer **Director of Audience Development** Sharon Silke Carty **Executive Director of Finance** Paul Neumaier

PUBLISHING CONSULTANTS Gilbert C. Maurer, Mark F. Miller

INTERNATIONAL EDITIONS China, Greece, Spain, US



Using Shell V-Power® NITRO+ Premium Gasolines and diesel fuels appropriately in Car and Driver test vehicles ensures the consistency and integrity of our instrumented testing procedures and numbers, both in the magazine and online.

CUSTOMER SERVICE
Call 800-289-9464,
email cdbCustServ@
CDSFulfillment.com, visit
www.CarandDriver.com/
service, or write to
Customer Service Dept., Car
and Driver, P.O. Box 37870,
Boone, IA 50037 for
inquiries/requests, changes
of mailing or email
addresses, subscription
orders, payments, etc.

PERMISSIONS Material in this publication may not be reproduced in any form without permission.

To order digital back issues, go to your favorite app store. Car and Driver® is a registered trademark of Hearst Autos, Inc. Copyright 2022, Hearst Autos, Inc. All rights reserved.



WEIGHT OF IT

Let me get this straight: I could buy three new Tundras for about the cost of the electric GMC Hummer ["The Oppenheimer Project," January 2022]? I vote for the Tundras—all three of them.

—Jerry Dawson
Citrus Hills, FL

I'm a retired CPA and have enjoyed your mag since I was a kid. Now, honestly, I don't drive off-road, but can you explain how the Hummer EV, or any vehicle, for that matter, with 15.9 inches of ground clearance, can "climb over" an 18-inch vertical obstacle, assuming that the vehicle has to come down on the other side of the obstacle, no?

—Robert Foldes
North Bellmore, NY

The low point in the ground clearance is at the axle, and the tires maintain that clearance provided they roll over the obstacle simultaneously—Ed.

I am all for saving the world any and every way we can, but is this bloated tank the answer? I remember when 4000 pounds was heavy, but this thing is in a whole other dimension. I'd hate to see what my Porsche 964 would look like after getting rear-ended by a distracted driver piloting this pig.

—Gavin Berger
Delray Beach, FL

At least it's lighter than three Tundras—Ed.

DISCO DANCING

I absolutely agree with Ezra Dyer's take on the headaches that come with modern tech ["Save

the DVD Player," January 2022]. That's why I would have marched right back into Walmart and dropped an extra \$50 or so on a portable DVD player. Also, I for one am disappointed to see Sharon Silke Carty go. Ed. gave me some laughs!

—Joe T.
Portage, PA

I've been with you uninterested, and continue to be with you, since 2011—Ed.

How about bringing back the CD player? Boomers like to play CDs in our cars, but for the past few years that hasn't even been an option. My 2021 Ranger doesn't have any slot to put a CD. I hope the car companies rethink this one.

—Al Parent
Walker, MI

EXPECTATIONS

In the January 2022 issue, the Hyundai Kona N Line's zero-to-60 time is described as "a not particularly impressive 7.3 seconds." A few pages later, the Volkswagen Taos is said to have a 60-mph time of "an adequate-if-not-spirited 7.4 seconds." I would have to believe that Dieselgate blew through VW's car-rag bribe money, so it would seem that someone needs their butt dyno recalibrated.

—Jeff Bjerke
Klein, TX

The Kona N Line purports to be a performance vehicle and as such sets a higher expectation for acceleration, but it's not quicker than a regular Kona with the 1.6-liter turbo. The Taos doesn't pretend

to be anything other than a mass-market crossover. While the loaded Taos we tested stickered at over \$30K, at its \$24,190 base price, the 7.4-second run is competitive—Ed.

GETTING REAL

I've been to the alternate timeline. The Pontiac Aztek took off and Ralph Nader mandated automatics, so stop complaining.

—Sean Sweaney
Nashville, TN

It sounds like we're on the same timeline—Ed.

Big-man driver named K.C. Colwell look like flatulent, exhibitionist bear in Moscow Zoo.

—Nastassja Kinski
Coopersville, MI

The All-In-One Grill

No other outdoor cooker can match the quality and versatility of a Big Green Egg. Whether searing a steak at 750 degrees, roasting, baking or smoking low and slow, everything tastes better cooked in an EGG.

EST.
1974

Shop online for
home delivery by
a certified dealer in
your own community
BigGreenEgg.com



Big Green Egg.

© COPYRIGHT BIG GREEN EGG • BIG GREEN EGG®, EGG®,
THE GREEN COLOR® AND THE ULTIMATE COOKING EXPERIENCE®
ARE REGISTERED TRADEMARKS OF BIG GREEN EGG INC.

Upfront

COMING INTO BLOOM

By Jamie Kitman

Lotus Operandi

As always, the tiny British carmaker has ambitious plans, but a major investment from Chinese giant Geely means this time they might happen.

➔ **Increasing profits** is the goal for Matt Windle, managing director of Group Lotus since January 2021. He's presiding over an explosion of new products and a well-funded future made possible by the deep pockets of Geely. The Chinese giant has pumped more than \$3 billion into the plucky but chronically underfunded British sports-car and racing marque.

Lotus has said goodbye to standard-bearers—Elise, Exige, Evora—over the past few years and next plans to fire off new products, including its first SUV, like Steph Curry on a three-point tear.

Launching as you read this, and due in America this fall, is the Emira, which the company calls its last gasoline-powered car. Coming “late in the second

No car company can hold out against the SUV for long. Designed in Germany and assembled in China, the electric Eletre is Lotus's first SUV.





COMING INTO BLOOM

quarter, early third quarter,” according to Windle, is the oft-delayed Evija, a near-2000-hp electric hypercar with a price tag of more than \$2 million—an edition so limited it skirts import regulations by qualifying as “show and display only.” Then, in the not-too-distant future, expect a series of more affordable electric sports cars based on the company’s new aluminum-intensive platform. The so-called light electric-vehicle architecture (LEVA) aims to move the goalposts from what the Elise’s groundbreaking chassis did back in the 1990s. Substantially lighter—lightness being Lotus’s *raison d’être* since its founding by Colin Chapman almost three-quarters of a century ago—the Evija’s rear structure tips in with 37 percent less mass than the Emira’s. LEVA will underpin a range of sports machines of different sizes, with batteries stacked vertically behind the driver or laid out horizontally, skateboard-style.

Following its best sales year since 2011, Lotus anticipates its new sports cars will triple its annual volume to about 7500 vehicles. Such record sales would be news in itself, as would sustained profitability and the company’s ability to self-fund moving forward. But Lotus has bigger things in mind, with a tenfold production increase anticipated overall. The majority of additional volume is expected to come from SUVs built in China. The Eletre, a “hyper-SUV” designed and engineered in a new Lotus Tech Innovation Centre in Raunheim, Germany, is to be assembled at a \$1.3 billion plant in Wuhan. The highly aerodynamic, comparatively low-slung, dual-motor vehicle, with 800-volt architecture and an expected sub-three-second zero-to-60-mph time, will go on sale in the land of its manufacture first. Big growth in China, currently its 10th-biggest market (the U.S. is first), is central to Lotus’s plans as it seeks to mimic Porsche’s SUV success.

The idea of a Lotus SUV may strike some as even more oxymoronic than when Porsche launched the Cayenne. While acknowledging that the Eletre will be the company’s heaviest car ever, Windle believes that it will retain the core Lotus values. “We don’t have a V-8 or a V-12 in the front, so we are able to play with short overhangs, which is Lotus,” he says. “It’s muscular in design, which is Lotus again, but very, very aerodynamic. When we brought Evija out in 2019, as much as we wanted to make a statement then with a halo product that would put the Lotus brand back in focus and show what we can do with technology, we also knew it was setting the design DNA for the future. And you can see some

“The Eletre will make Lotus accessible to a whole new audience.”

—Qingfeng Feng, CEO, Group Lotus



of those elements in Emira. And you’ll see that again in the [Eletre] when it comes out, that there’s porosity through the car. We find that for us to get really efficient cars, we must allow the air to go not just over and under but through the car as well.”

Windle sees the Lotus touch, too, in the upcoming vehicle’s rigorous excision of weight and even its hidden lidar system. “It’s designed in a Lotus way, that you can have it on or you can have it off,” he says. “When you turn on autonomous driving, the lidar pops up out of the roof and out of the rear header. And the inspiration for that was the old Lotus [pop-up] headlights. So whilst it’s an incredibly technology-focused, future-looking vehicle, it also has a good thread of Lotus DNA running through it.”

Two new U.K. plants—one for final assembly at Hethel, Lotus’s longtime Norfolk home, and another at nearby Norwich combining its aluminum-chassis and steel-subassembly manufacturing businesses in



FÜR ELISE

We hate to see the Lotus Elise go. While we haven't been able to buy one here since 2011, Lotus's lightweight two-seater carried on in the rest of the world. After building more than 35,000 of them, the company has now ceased Elise production, and the final car went to Elisa Artioli, its namesake. Artioli's grandfather Romano Artioli owned Lotus when the Elise debuted in 1995. At two years old, she presided over its debut at the Frankfurt auto show, and to bookend its history, the 28-year-old Elisa now owns the last Elise, a Sport 240 Final Edition in Championship Gold.

one site—represent a \$130 million investment. But the Wuhan plant's 150,000-unit capacity suggests the company is placing many of its chips on SUVs. Wuhan is also home to a new division, Lotus Technology, which will be “integrating a new generation of lifestyle products.”

In addition to Lotus and its own home-market brand, Geely also owns Volvo, London EV (the London Taxi maker), Malaysia's Proton, and a 10 percent share in Daimler-Benz. Observers have been particularly impressed with its success turning around Volvo, bought from Ford for less than \$2 billion. The Geely formula—purchase an established brand with a loyal following but insufficient funds, then underwrite its skilled, brand-aware engineers to get on with it—has worked well. Volvo has enjoyed record sales, while Polestar, the electric-car company Geely formed with Volvo, is expected to have a \$20 billion valuation when it goes public.

The ascension of Windle, an engineer with EV experience, marked for many a welcome change from recent Lotus bosses, including Dany Behar, a pure marketer, and Jean-Marc Gales, a turnaround specialist with an engineering background. Windle started at Lotus, then moved to Tesla to help develop the Lotus-based Roadster, has toiled for several years on the Emira, and seems well suited to the task at hand. He praises Gales (now at Williams Advanced Engineering, a technology consultancy spun off from the highly regarded F1 team): “Jean-Marc had a job to do. He had to take the business to a point where it could be sold, which he achieved. And we must thank him for that, because that brought Geely in and the goodness that's come with that.”

On the other end of the spectrum is the Evija, with four motors good for 2000 electric horses. It isn't street-legal in the U.S.

Windle sees ways to marry autonomous-driving technologies with the skillset of a company devoted to hands-on drivers. “There could be a feature where you're on a track and the car could teach you the track lines and how to be safe with it on the track,” he says. “You can turn it on and off, so either you are fully engaged with automated systems or you can pretty much drive an analog car.” He readily acknowledges, however, the “big challenge” ahead for Lotus, a firm known for light weighting, as it goes whole-hog into an electric landscape saddled with heavy battery packs.

“An electrified Elise-type vehicle or something like that should be the aim, really,” Windle says. “Because you can get the weight down, and the more you reduce the weight, the more you can reduce the battery. You just keep going down, reducing weight and batteries.”

The goal: add lightness, and batteries.





SOUND THE ALARM

By Benjamin Hunting

Missed Signals

Is your car actively helping you drive? The answer isn't as clear as it needs to be.

→ There's a group of features trickling down from luxury vehicles into more affordable fare. ADAS (advanced driver-assistance systems) is the collective term for technology designed to take over some part of driving duties with lane centering or follow-along capability combined with adaptive cruise control and automatic braking. All of this relies heavily on hyperaccurate highway mapping, radar guidance, stereoscopic cameras, other sensors, or a combination of these things to keep tabs on the road, surrounding traffic, and sometimes the driver.

Currently, there's no standard in place from the National Highway Traffic Safety Administration for how ADAS should notify drivers of its actions, but there should be. While some vehicles are clear about when software is taking over, others are subtle, with warnings flickering at the periphery. Without a common standard, systems with enhanced hands-free capabilities, such as GM's Super Cruise, have more prominent communication than simpler systems where hands are never supposed to leave the wheel.

The lack of clear and standardized alerts has spurred the Insurance Institute for Highway Safety to evaluate how ADAS communicates what systems are deployed at any given time. The first ratings will be published later this year.

In the same way that automakers use standardized warning-lamp icons, we're expecting that ADAS-equipped vehicles will eventually adopt a common means of telling the driver what's engaged.



YOU TALKIN' TO ME?

How does the current crop of ADAS-features often called "semi-autonomous"—stack up in terms of notifying owners whether they're active? Even top-tier systems deliver different levels of communication.



MASS COMMUNICATION
Like your therapist says, it's all about communication. GM does a good job with Super Cruise. In addition to an audible alarm, an enormous illuminated bar at the top of the steering wheel changes color from green during happy Super Cruising, to cautionary yellow, to disengaged red.



MIDDLE OF THE ROAD
Tesla Autopilot, Ford BlueCruise, and Nissan ProPilot Assist all use a large graphic representation of the vehicle in the gauge cluster or center screen, augmented by an alarm or icons representing surrounding traffic. The messaging is pretty clear, but it could be better.



WHO IS DRIVING?
It's easy to misunderstand when Volvo Pilot Assist and Kia Highway Driving Assist are on. To indicate steering assistance, both rely on small, color-shifting icons within the instrument cluster alongside a separate icon for adaptive cruise control as well as occasional but inconsistent chimes.

All-new with military know-how

Meet Valentine One[®] Generation 2

“It’s about range superiority. I told my engineers, ‘We want the best radar-seeking engine this side of the military.’

In fact, we adapted a concept from military CHIRP radars used to find fainter targets farther away with higher precision; it’s a SAW Dispersive Delay Line, **SAW D²L**. For civilian users, V1 Gen2 is a breakthrough on range.”

— Mike Valentine



V1 Gen2 brings new detection tools

New LNA technology: The only way to extend range is to detect ever weaker signals. Think of LNA as a signal magnifier.

LNA has another benefit—it acts as a one-way valve, trapping LO output before it escapes V1 Gen2’s magnesium case. That’s the key to stealth. V1 Gen2 is practically undetectable.

V1 Gen2 is totally reengineered

- Much longer range, yet fewer false alarms.
- All-new and patented circuitry, **SAW D²L** powered.
- LNA technology on all bands.
- Laser detection on all V1 Gen2s.
- Built-in Bluetooth[®] smartphone connection.
- All-new high-contrast display.
- V1’s legendary Radar Locator and Bogey Counter, back by popular demand.

We call it V1 Gen2. You’ll love it.

New, and patented, **SAW D²L:** Detecting more radars adds exponentially to data flow. **SAW D²L** jumps the processing rate more than a hundred times, enabling V1 Gen2 to quickly sort speed-trap radar signals from today’s glut of lane-change and crash-prevention radars.

Range superiority

LNA’s faint-signal acquisition feeding the high-rate analysis of **SAW D²L** adds up to a breakthrough in radar early warning. The range increase on Ka band is especially dramatic. Our new K-Verifier weeds out unwanted K alerts.

Future upgrades via smartphone

V1 Gen2 has a built-in Bluetooth connection for iPhone[®] and Android[™] devices. Our app is free, and future upgrades are easy via smartphone.



Valentine One[®]
— **Gen2** —
RADAR LOCATOR

www.valentine1.com
1-800-331-3030

Valentine One Generation 2 is a trademark of Valentine Research, Inc. | SAVVY is a registered trademark of Valentine Research, Inc.
iPhone is a registered trademark of Apple, Inc. | Android is a trademark of Google, Inc. | Bluetooth is a registered trademark of Bluetooth SIG, Inc.

©2021 VRI

U

ANIMAL CRACKERS ~ By Benjamin Hunting



When Animals Attack... or Snack

Insurance claims can get wild, with a whole zoo of creatures out there ready to jump, fly, or chomp their way into your car.

➔ Like many of us, deer have been having a hard time. According to State Farm, as of June 2021 in the U.S., insurance claims due to animal collisions were up 7.2 percent in a year, and two-thirds of those accidents involved Bambi's relatives (don't tell your kids). Drivers in West Virginia have the highest chance of hitting an animal, and those in Hawaii are least likely to. But don't book that flight just yet—wildlife is wild everywhere.

MARTENS

GERMANY

Also known as German weasels, martens love the taste of automotive wiring, engine hoses, silicone, and rubber so much that they're responsible for more than 200,000 insurance claims annually. It's a multimillion-dollar problem, with virtually no soft material safe from the unstoppable teeth of these heat-seeking varmints, which are drawn to the warmth of engine bays and undercarriages.

KANGAROOS

AUSTRALIA

According to an Australian insurance company's *Roo Report*, 90 percent of animal-impact claims Down Under are tied to these big-footed bounders. The winter months are the most dangerous for driving, with \$20.7 million in damages doled out every year.

PIGS

HAWAII

The island paradise has no native deer, kangaroos, or

weasels. Unfortunately, invasive animals—both deer and mongooses—are still a problem. But it's feral pigs that do the most damage, with nearly 400 collisions reported between July 2020 and June 2021.

CAMELS

SAUDI ARABIA

Half a million camels live within Saudi Arabia's borders, and wandering strays along unfenced roads are responsible for 97 percent of animal collisions in the country. When a speeding car cuts a camel's towering legs out from underneath it, these desert moose have the alarming propensity to flop onto the hood and through the windshield.

SPIDERS

EVERYWHERE!

Okay, it would have to be a terrifyingly large spider to cause collision damage, but in 2013, Toyota was forced to recall 870,000 vehicles because tiny arachnids built sticky webs that blocked an HVAC-

condensate drainage tube, leading to water-damaged control modules that posed a risk of explosive airbag deployment (with three confirmed incidents among owners). Two years earlier, Mazda had spider woes of its own. The automaker recalled 52,000 sedans after webs clogged fuel-system vent lines, threatening to crack open gas tanks and cause fires. These critters are such a problem across the industry that Ford even developed a "spider screen" to keep them out of a vehicle's sensitive areas.

RODENTS

OH GOD, RATS TOO?

Like the German weasels, rodents and lagomorphs cause extensive damage, with increased insurance claims as populations boom and automotive complexity increases. More delicious wires and hoses mean more snacks and nesting spots for rats, mice, rabbits, and, notoriously in Sequoia National Park, marmots.

FREAKS OF NATURE

Not all animal attacks are recurring. Some are one-off incidents—at least we hope so. **Bye-Bye, Bison** In 2015, a bison charged a couple cruising down a Yellowstone road, resulting in a \$2788 repair claim on their Nissan Xterra. **But Was It an AMC Eagle?** In the summer of 2021, city officials in Neenah, Wisconsin, discovered an enormous carp lying on the ground beside a severely dented municipal vehicle. Insurance investigators and police concluded that it had likely been dropped by a dive-bombing eagle unable to hold on to a slippery lunch. **Better Check the Trunk** A lovelorn wild elephant went on a rampage in 2016, damaging vehicles parked along a tourist road near a Chinese nature reserve. Reportedly, the car owners "found the experience to be thrilling" and, even better, covered by insurance.

Bad to the Bone

Full tang stainless steel blade with natural bone handle —now **ONLY \$79!**

The very best hunting knives possess a perfect balance of form and function. They're carefully constructed from fine materials, but also have that little something extra to connect the owner with nature. If you're on the hunt for a knife that combines impeccable craftsmanship with a sense of wonder, the **\$79 Huntsman Blade** is the trophy you're looking for.

The blade is full tang, meaning it doesn't stop at the handle but extends to the length of the grip for the ultimate in strength. The blade is made from 420 surgical steel, famed for its sharpness and its resistance to corrosion.

The handle is made from genuine natural bone, and features decorative wood spacers and a hand-carved motif of two overlapping feathers—a reminder for you to respect and connect with the natural world.

This fusion of substance and style can garner a high price tag out in the marketplace. In fact, we found full tang, stainless steel blades with bone handles in excess of \$2,000. Well, that won't cut it around here. We have mastered the hunt for the best deal, and in turn pass the spoils on to our customers.

But we don't stop there. While supplies last, we'll include a pair of \$99 8x21 power compact binoculars *and* a genuine leather sheath **FREE** when you purchase the **Huntsman Blade**.

Your satisfaction is 100% guaranteed. Feel the knife in your hands, wear it on your hip, inspect the impeccable craftsmanship. If you don't feel like we cut you a fair deal, send it back within 30 days for a complete refund of the item price.

Limited Reserves. A deal like this won't last long. We have only 1120 **Huntsman Blades** for this ad only. Don't let this beauty slip through your fingers. Call today!

Huntsman Blade ~~\$249~~*

Offer Code Price Only **\$79** + S&P **Save \$170**

1-800-333-2045

Your Insider Offer Code: **HUK757-01**

You must use the insider offer code to get our special price.

Stauer® 14101 Southcross Drive W., Ste 155, Dept. HUK757-01
Burnsville, Minnesota 55337 www.stauer.com

*Discount is only for customers who use the offer code versus the listed original Stauer.com price.

California residents please call 1-800-333-2045 regarding Proposition 65 regulations before purchasing this product.

- 12" overall length; 6 1/2" stainless steel full tang blade
- Genuine bone handle with brass hand guard & bolsters
- Includes genuine leather sheath

Stauer... *Afford the Extraordinary.®*

**EXCLUSIVE
FREE**

Stauer® 8x21
Compact
Binoculars

-a \$99 value-
with purchase of
Huntsman Blade



BONUS! Call today and you'll also receive this genuine leather sheath!

What Stauer Clients Are Saying About Our Knives

★★★★★

"This knife is beautiful!"

— J., La Crescent, MN

★★★★★

"The feel of this knife is unbelievable...this is an incredibly fine instrument."

— H., Arvada, CO



Rating of **A+**



U

THE ENLIGHTENMENT ~ By Csaba Csere

THE LUCID AIR'S HEADLIGHT CONSISTS OF SIX LIGHTING MODULES.

FIVE MODULES MAKE UP THE LOW-BEAM; THE INNERMOST IS THE HIGH-BEAM.

A collimator aligns the light waves, giving the headlights a crisp edge.

A heat sink absorbs the energy that LEDs generate while making light.

A microlens array consists of many small lenses to precisely focus the light.

Along with the microlens array, altering the LEDs' brightness allows the headlights to control where the light is sent.

Bright Idea

NHTSA recognizes that lights can be more sophisticated than simple high- and low-beams, which may mean that adaptive headlights can finally be switched on.

→ U.S. regulators have never been excited about headlight innovation. For decades, they stuck us with dim and boring sealed-beams while the rest of the world moved on to brighter quartz-halogen bulbs housed in streamlined fixtures. But the feds came around—eventually. In mid-February, the National Highway Traffic Safety Administration (NHTSA) finally approved adaptive headlights, which have been in use in the rest of the world for over a decade.

Adaptive lighting is a term for lights that change their intensity, direction, and pattern to match road and traffic conditions. One example: recognizing an oncoming car and cutting off the portion of your high-beam directed at it while shining your brights everywhere else. The blocked light even tracks the approaching car as the relative angle changes. As you come up behind a driver in your own lane, adaptive lights can cut the segment of your high-beam shining in the car's mirror while still maintaining full brightness on either side of the vehicle. Such systems can even illuminate a pedestrian on or near the roadway with a spot-beam to signal both parties of each other's proximity.

Getting this to work requires headlights that can precisely control the shape and intensity of their beams and systems that can accurately detect cars and other objects. The introduction of LED headlights made it all easier. The Lucid Air, which is just

going on sale, uses 43 LED elements per headlamp. These are clustered in several projector-beams that can adjust in roughly 1-degree increments, according to Hans-Christoph Eckstein, Lucid's director of electronics and optical engineering. The Air's onboard cameras, shared with the car's driver-assist systems, control the beams.

Another approach is a series of tiny computer-controlled mirrors, each of which is responsible for a sliver of light. Audi calls its version Digital Matrix LED technology, and according to spokesman Mark Dahnke, it provides more delicate control than distinct LED elements. Back at Lucid, Eckstein says this method is less energy efficient than the multiple-LED system, which is why the battery-powered Air does not employ such a setup.

Such adaptive-lighting solutions are already present, though disabled, on many cars sold stateside, because it's often cheaper to use the same lighting unit in markets around the world. Of course, there was also hope that U.S. regulations would eventually permit their use.

Unfortunately, according to Eckstein, NHTSA regulations require field testing of the headlights as installed in vehicles, unlike the European rules, which rely on component testing. So existing adaptive lights, which automakers can theoretically enable through software changes, will remain dormant until they pass the new tests. No one knows how long that will take, but Eckstein says Lucid wants to be first to deploy the technology and has over-the-air updates ready. Of course, Audi and others have similar ideas. Our guess is that the first of these new lights will go active in the U.S. between early summer and the end of the year. In the meantime, your brights are on.

43
POINTS
OF LIGHT

A Lucid Air headlight contains 43 LEDs: 16 in the innermost module for the high-beam, nine in each of the next two modules, and three in each of the outer three.

PORTABLE

Car Lift for Home Use

The MaxJax portable two-post lift is one of the most versatile DIY tools ever invented. Its patented design allows you to get full-sized lift advantages in spaces with limited ceiling heights. Best of all, MaxJax is completely portable and can be setup virtually anywhere. For more info call **1-844-629-5291** or visit **MaxJax.com**.

 See it on YouTube

1. Roll It



2. Work It



3. Stow It



1-844-629-5291 • www.MaxJax.com

©2022 MaxJax, LLC, a subsidiary of BendPak Inc. The MaxJax is protected by one or more patents or claims of patents in the U.S. and elsewhere. PATENT NO. US 8.256.577 B2 - PATENT NO. US 9.150.395 B2.

MAXJAX



autostacker.com | 1-888-977-8225

© 2022 BendPak Holdings LLC. A wholly owned subsidiary of BendPak, Inc. Autostacker is protected by one or more patents in the United States, China, Europe, and other countries.

AUTOSTACKER



Sound Opinions

All the audiophile brand snobbery in the world can't match the joy of stripping wires and skinning knuckles in pursuit of a boomin' system.

The McIntosh MX950 sound system in the new Jeep Grand Cherokee will split your head open. It's got a 17-channel amp, 19 speakers, and, as the name implies, 950 watts. The bass will rattle loose change out of your pockets. A punchy snare can make your socks fall down. If you told me you want to feel like you're in the recording studio with Steely Dan, I'd say be careful what you wish for, but the McIntosh will take you there. You really wouldn't want to change anything about it. Which is fortunate, because you can't.

Car stereos from my formative years—the 1980s and '90s—were mostly standardized, with a DIN-size head unit directly powering whatever flimsy speakers the manufacturer deigned to provide. But both head unit and speakers were easy to replace, and once you had the interior torn apart anyway, you might as well add an amp and a subwoofer. By high school, I was well versed in impedances and crossover slopes and fuse blocks, and I could install my own stuff

semi-competently, as could my friends. This free labor allowed us to plow more of our summer-job earnings into increasingly ridiculous sound systems, until I came to believe that having two 12-inch subwoofers (as I did in the IROC) was the bare minimum to do justice to “Whoomp! (There It Is).” My friend Adam had a dual 15-inch speaker box that he once pulled out of his Subaru and used to DJ a high-school dance. That's where we set our standards: If your car stereo sounds loud in a gym, it's probably almost loud enough for your car.

I first foresaw the end of zany DIY car stereos in the early 2000s, when my buddy Dave tried to put a relatively restrained system (only one amp and 10-inch sub) in his Saab 9-3. Even with a professional installation, the aftermarket head unit disabled the Saab's security system, which was somehow networked into the factory stereo. Dave could crank Elton John's “Tiny Dancer” or have a functioning keyless entry system, but apparently not both. The 9-3 presaged the imminent demise of sound systems that could be hot-rodged by high-school kids.

But you know what doesn't have an infotainment system? The regular-cab 2003 Ram that I bought last year. Among its minor foibles was a dead stereo, so I decided to resurrect my old skills and revive it with a semi-boomin' system. Since aftermarket head units typically evince the cool aesthetic restraint of a Japanese pachinko parlor, I bought a Chrysler OEM replacement (from the creatively named 1 Factory Radio company) discreetly hacked with an auxiliary jack so you can plug in a phone. Then I ordered a slim eight-inch powered subwoofer to hide under the seat and embarked on a fun and rewarding project. Ah, that old familiar feeling of wishing you paid someone else to do this! I remember it well. Speaking of which, did you know you have to remove the Ram's upper seatbelt anchors to get at the rear speakers? Running the power cable to the battery required breaching some kind of firewall grommet with a coat hanger. In the process, I lacerated my hand on various unseen razor-sharp pieces of metal that Dodge included just to frustrate this process and get you to trade your dumb truck for one with the Infinity sound system.

After going full MacGruber and tapping into a switched hot wire to get the amp to wake up, I had a system that looked stock but thumped hard. Which is great, except now I'm thinking of all the other stupid things I could do—kick-panel components, multiple amps, behind-the-seat sub boxes. Maybe I don't know how to build a car stereo that sounds as good as a McIntosh MX950. But I bet I still know how to make one that's louder. ■

SECRETS OF A BILLIONAIRE REVEALED

*"Price is what you pay; value is what you get.
Whether we're talking about socks or stocks, I like
buying quality merchandise when it is marked down."*
— wisdom from the most successful investor of all time

Absolute best price
for a fully-loaded
chronograph
with precision
accuracy...

**ONLY
\$29!**

We're going to let you in on a secret. Billionaires have billions because they know value is not increased by an inflated price. They avoid big name markups, and aren't swayed by flashy advertising. When you look on their wrist you'll find a classic timepiece, not a cry for attention—because they know true value comes from keeping more money in their pocket.

We agree with this thinking wholeheartedly. And, so do our two-and-a-half million clients. It's time you got in on the secret too. The **Jet-Setter Chronograph** can go up against the best chronographs in the market, deliver more accuracy and style than the "luxury" brands, and all for far, far less. \$1,150 is what the **Jet-Setter Chronograph** would cost you with nothing more than a different name on the face.

With over two million timepieces sold (and counting), we know a thing or two about creating watches people love. The **Jet-Setter Chronograph** gives you what you need to master time and keeps the superfluous stuff out of the equation. A classic in the looks department and a stainless steel power tool of construction, this is all the watch you need. And, then some.

Your satisfaction is 100% guaranteed. Experience the **Jet-Setter Chronograph** for 30 days. If you're not convinced you got excellence for less, send it back for a refund of the item price.

Time is running out. Now that the secret's out, we can't guarantee this \$29 chronograph will stick around long. Don't overpay to be underwhelmed. Put a precision chronograph on your wrist for just \$29 and laugh all the way to the bank. Call today!

**CLIENTS LOVE
STAUER WATCHES...**

★★★★★
*"The quality of their
watches is equal to many
that can go for ten times
the price or more."*

— Jeff from McKinney, TX

TAKE 90% OFF INSTANTLY!

When you use your OFFER CODE

Jet-Setter Chronograph ~~\$299†~~

Offer Code Price **\$29 + S&P** **Save \$270**

You must use the offer code to get our special price.

1-800-333-2045

Your Offer Code: JCW466-01

Please use this code when you order to receive your discount.

Stauer...Afford the Extraordinary.®



Rating of A+



"See a man with a functional chronograph watch on his wrist, and it communicates a spirit of precision." — AskMen.com®

Limited to
the first 1900
responders to
this ad only.

- Precision crystal movement • Stainless steel case back & bracelet with deployment buckle • 24 hour military time
- Chronograph minute & small second subdials; seconds hand • Water resistant to 3 ATM • Fits wrists 7" to 9"

Stauer®

14101 Southcross Drive W., Ste 155, Dept. JCW466-01, Burnsville, Minnesota 55337 www.stauer.com
† Special price only for customers using the offer code versus the price on Stauer.com without your offer code.



MMM Bop Appreciation

On a Southern road trip, Scherr gains a late-blooming understanding of what made the BMW M5 such a driver's darling.

You aren't supposed to meet your heroes for fear that they will fail to live up to expectations or ask to borrow money. But what about meeting other people's heroes? I didn't grow up in BMW circles. My friends' parents had Ford Taurus wagons and Chevy Astro vans. When we were old enough, my crowd drove hand-me-down Camrys and poorly tuned Dodge Darts. BMWs, especially M GmbH models, were for the bad guys in *Ronin* or the big-city boyfriend whom the main character leaves for the hometown fella in a Hallmark movie.

Even once I was working professionally with cars, my focus was on classics and domestic muscle. BMW 2002, sure. 2002 BMW? I don't know her. The first time I seriously looked at an M3 was when Chevrolet declared it the benchmark for the sixth-gen Camaro. Or was it Ford, which mentioned it as competition for the GT350? Either way, around 2016 or so, it occurred to me that people sure talked a lot about BMW's M cars when they were highlighting a certain

balance of handling, power, and refinement. Their eyes would get a glassy, faraway look, and their right hand would twitch around a remembered gearshift. These were clearly cars that set a standard other vehicles struggled to meet.

So it was with excitement—and a small amount of hero-meeting trepidation—that I embarked on a 400-mile M road trip, from Greenville, South Carolina, to Amelia Island in Florida, in a variety of M5s from BMW's Heritage Collection. I only wish we'd had more miles and more days, because there are a lot of overrated things in this world, but an early M5 isn't one of them. The second I turned the key on the '88 E28, I understood the appeal. Even with 34 years on it, the six-cylinder barked to the ready like a guard dog, and the five-speed shuddered in its pale leather wrap. It's sort of a cute car now, with slightly dorky underbite bumpers and an eager profile, but in the late '80s it must have been intimidating coming up in a rearview mirror at triple digits, blacked out like a censored letter, holding curves like Casanova.

I moved through rides like a time traveler, about a decade at a time, evolution in fast-forward. The E28 was quick and smooth, but the E34, a 1990, was quicker and smoother. It was less polished in some ways than the earlier car, more stripped down to the basics with a spare, gray cabin. But who needs butter when the bread is so good? The E34 got a stroked version of its predecessor's six and a hearty 310 horsepower. It was quick for its time, zero to 60 in 5.6 seconds. More impressive to me was the cool jazz vibe of the engine, which confidently hit the high (revving) notes all down the Atlantic coast.

My favorite M5, though—because you can take the girl out of the muscle car, but she'll always love a V-8—was the '00 E39. Elegant in fine-grained silver metallic, wide stanced, and mean eyed, the E39 would make an excellent villain's car, with a big trunk begging to be filled with stolen diamonds and a leather and burlwood interior designed for cackling in during the getaway. It was a gleeful high-speed cruiser, but running in sixth gear felt unfair to the others, so I slowed 'er down and left the highway for a web of side roads through trees hung with Spanish moss, where I came up hot on lumbering trucks just for the joy of downshifting for the pass. No wonder BMW drivers have a reputation: This car wants you to be bad; it likes it.

Like everything from the '80s and '90s, classic M cars are on a revved-up rise in collectibility, and I see why. While the modern M offerings would destroy any of the classic ones on a racetrack, they lack the playfulness of the early models. When I had to turn in the E39's key, I felt my eyes get glassy and my right hand twitch for just one more shift. Mmm, indeed. 🇺🇸



GET ALMOST 100 HOURS MORE **PROVEN QUALITY SLEEP** PER YEAR*

Quality sleep is proven to help boost energy, recovery and improve wellbeing.

That's why we created the Sleep Number 360® smart bed for the best sleep in the world.

Designed to help you fall asleep faster and make a life-changing difference to your health and wellness.



Adjustable comfort
on each side



Automatically senses
and responds to you



Personalized insights
for even better sleep



15-Year Limited
Warranty†



100-Night
Trial‡

sleep  number®



SCAN TO TAKE OUR BED QUIZ

*100 hours more proven quality sleep based on internal analysis of sleep sessions assessing sleepers who use multiple features of Sleep Number® products. Claim based on sleepers achieving over 15 more minutes of restful sleep per sleep session.†Limited warranty available at sleepnumber.com. ‡Restrictions and exclusions apply. Does not apply to adjustable bases, upholstered furniture, closeout/clearance or demo/floor model purchases or mattresses already exchanged under another In-Home Trial period. You pay return shipping. Refunds will be made to the original method of payment less original shipping/delivery fees. Visit sleepnumber.com for complete details. SLEEP NUMBER, SLEEP IQ, SLEEP NUMBER 360, the Double Arrow Design, and SELECT COMFORT are registered trademarks of Sleep Number Corporation. ©2022 Sleep Number Corporation



GOING NOWHERE FAST

PORSCHE'S FAMOUS GT DIVISION CREATED THE 718 CAYMAN GT4 RS, SO WE NATURALLY PIT IT AGAINST ONE OF SOCAL'S FINEST DEAD-END ROADS. MORE EVIDENCE THAT IT ISN'T THE DESTINATION, IT'S THE JOURNEY.

BY DAN EDMUNDS
PHOTOGRAPHY BY
JAMES LIPMAN

THE SAN GABRIEL MOUNTAINS ARE STILL GROWING. As the Pacific and North American tectonic plates crush and grind against one another, the mountains that border Los Angeles continue to creep upwards faster than gravity can pull them down. This creates major headaches for engineers who would dare attempt to build a road through ever-changing terrain. In the case of California's Highway 39, the result is a spectacular mountain road that goes nowhere, which turns out to be a perfect place to test another engineering marvel, the Porsche 718 Cayman GT4 RS.

Built in the late 1950s, the northern reaches of Highway 39 appear to be intact on most maps, apparently connecting the town of Azusa with the famed Angeles Crest Highway at a summit T-junction. But that hasn't truly been the case since 1978, when a massive mud and rock slide inundated a section of road at Snow Spring. The road now ends at a locked gate adjacent to a spectacular overlook 6.2 miles shy of the Crest. Heading north out of Azusa, 39 wanders past one final housing tract, then bends over a bridge until it slices through a gap in the rock that feels like Turn One, the point where the canyon



walls soar, the road gets truly sinuous, and the fun begins as we downshift into attack mode. Almost immediately the shrill note of the GT4 RS's mid-mounted 4.0-liter flat-six reverberates off the canyon walls as we pass the first of many "Falling Rock" signs and, quite regularly, small crumbs of former mountain that must be accounted for as we sight our line through the onrushing corners.

Priced from \$144,050, if you're lucky enough to secure one, the GT4 RS undercuts the 911 GT3 by nearly \$20,000. Sure, you can nudge it close to \$200,000 if you get frisky with the options sheet, but that's par for the course in

Porscheland. What you get for your dollars is a Cayman with the heart and soul of a 911 GT3.

The RS's six isn't a massaged version of the enlarged and deturboed 911 engine that powers the 4.0-liter Cayman GT4. This car earns its RS stripes thanks to Porsche fitting the same 911 GT3

Cup-derived engine that powers the vaunted 911 GT3, but spinning it 180 degrees and mounting it beneath the rear

parcel shelf, a placement that is less offensive to the laws of physics than the 911's rear-engine arrangement. In the GT4 RS, this high-revving, naturally aspirated, dry-sump flat-six makes 493 horsepower at 8400 rpm and 331 pound-feet of torque at 6750 revs. It's worth noting that the same six puts out 502 ponies and 346 pound-feet in the GT3. That makes us wonder whether the difference is truly the result of an exhaust packaging limitation related to the mid-engine placement or a case of preserving Porsche's sports-car caste system, which puts the 911 GT3 above the GT4 RS.

The GT4 RS makes quick and satisfying work of this early stretch, owing to hyper-accurate steering that gives the arm buckets of information as the fat Michelin Pilot Sport Cup 2 R tires alternately bite left and right

Porsche's Arctic Grey is shockingly close to Highway 39 tarmac, but don't expect it to work as camo—cops can hear the GT4 RS from a few corners away.





**PORSCHE 718 CAYMAN
GT4 RS vs. HIGHWAY 39**

California Highway 39 technically starts in Orange County, but it doesn't get really interesting until you're north of Azusa. The road climbs to over 5000 feet before you reach the locked gates that cordon off a section obliterated by a massive rock slide in 1978. What goes up must come down, after all.



into the tarmac. Compared with the GT4, the front and rear track widths of the GT4 RS are broader by 0.2 and 0.3 inch, respectively. The asphalt isn't consistently smooth, though, so it's best to leave the two-stage adaptive dampers in the default setting. Struts at all four corners are nothing exotic, but the suspension gives you all the control you need, thanks to track-optimized spring and damper tuning and ball-joint attachment points. It's a bit punishing around town, but the trade-off is nanometer precision in the canyon.

Corners come at a relentless cadence as we skirt past two dams and their attendant lakes. None of the turns are yet tight enough to fully exercise the \$8000 carbon-ceramic brakes, which, in conjunction with those Michelins, bring the GT4 RS to a halt from 70 mph in a very short 132 feet, a stop that puts you into the belts with an average of 1.25 g's of force. It's great to have such strong brakes to fall back on, but there isn't all that much slowing to do when Cup 2 R tires Velcro themselves to the tarmac to the tune of 1.11 lateral g's. If you do work the 16.1-inch front and 15.4-inch rear rotors, the seven-speed dual-clutch automatic snaps off incredibly timed downshifts, putting you in the right gear for every corner.

A side road called East Fork appears. After a 90-degree turn over a box-girder bridge, this optional diversion runs six miles up a side canyon to another dead end. We won't be getting out of the GT4 RS to do the 10-mile round-trip hike to the Bridge to Nowhere, an unintended monument to a failed 1930s attempt at roadbuilding that raging floodwaters and bounding boulders abruptly terminated. Instead, we'll tear ass back to Highway 39.

Some of the last slowpokes you're likely to encounter will almost certainly peel off at the off-road area and the West Fork trailhead, which is perfectly timed because 39 begins to straighten out north of the Forks. The first long straight comes into view,

The front fenders' trailing edge is cut out to smooth airflow, resulting in improved aero and brake cooling. A four-point titanium roll bar is Europe-spec only.



although it's not nearly enough road to verify the GT4 RS's 196-mph top-speed claim. But you can avail yourself of the flat-six's 9000-rpm wail, which is especially potent because the mid-mounted engine is pretty much a passenger in the cabin, sitting where a back seat would be. Its glorious soundtrack is accentuated by the gulping harmony created by high-mounted air intakes where rear quarter-windows reside in other Caymans, with ducting running right behind your skull to an intake plenum just over your right shoulder. And then there's the gearing, which is much more closely spaced than the Cayman GT4's PDK, the effect of which is magnified by an ultrashort RS-exclusive 4.17:1 final-drive ratio.

Use launch control and the GT4 RS hooks up hard. The time it takes a car to get to 30 mph is a good test of available traction, and the RS's 1.1-second time is tied for the quickest we've measured in a rear-drive car. Acceleration doesn't let up—60 mph passes in 2.8 seconds. Hold on for 20.8 seconds and 160 mph arrives.

High-speed sweepers collapse into tight, climbing switchbacks. The RS shortens straights into nonexistence as we repeatedly tap its 2.1-second 30-to-50-mph acceleration. Understeer never reveals itself. The holding ability and slightly hunched-forward posture of the one-

The exposed carbon-fiber hood is part of the Weissach package, which you have to select if you want the 21 pounds of weight savings that comes with the forged magnesium wheels.



Plus Mid-mounted GT3 engine, insane grip and braking, howling flat-six note. Minus Rough daily ride, PDK only, consider earplugs. Equals The no-compromise Cayman we've all been waiting for.

piece fixed carbon buckets make complete sense as the road climbs ever higher because you're positioned up on the wheel in a way that gives you steering leverage you didn't know you would need.

Closer to the top, the corners open back up into gentler curves. This is where onlookers in the turnout at the top really start to wonder what the hell is screaming up at them. We rocket past, and the closed gate eventually appears. The assembled motorcyclists and sport-compact enthusiasts try to look unimpressed as we climb out. The GT4 RS's exhaust pings as it cools, and we notice the odd pebble and small stone bouncing onto the pavement from the cliff above as gravity feuds with the upthrust of the San Gabriel Mountains.

On-again off-again plans to reestablish the connection to Angeles Crest Highway have been on the books since the road closed, with the latest attempt set to have construction start in 2027. Instead of waiting around, we're turning around and ripping back toward Azusa as fast as we can.



2022 PORSCHE 718 CAYMAN GT4 RS

Price
As Tested **\$198,297**
Base \$144,050

Vehicle Type: mid-engine, rear-wheel-drive, 2-passenger, 2-door hatchback
Options: forged magnesium wheels, \$15,640; Weissach package, \$13,250; carbon-ceramic brakes, \$8000; Arctic Grey paint, \$3540; front-axle lift, \$3040; Black with Deep Sea Blue leather and Race-Tex seat trim, \$2160; Michelin Pilot Sport Cup 2 R Connect tires, \$2107; Porsche Dynamic LED headlights, \$2020; Bose stereo, \$990; carbon-fiber window triangle trim, \$730; wheels painted satin Indigo Blue, \$600; Race-Tex sun visors, \$590; smartphone compartment, \$560; Deep Sea Blue seatbelts, \$360; Light Design package, \$350; Chrono package, \$310
Infotainment: 7.0-inch touchscreen; Apple CarPlay; satellite radio (3 months included); 11.0-GB media storage, minijack, 1 USB, 2 SD-card, and Bluetooth inputs; Wi-Fi hotspot; Bose stereo, 8 speakers

Engine
flat-6, aluminum block and heads
Bore x Stroke 4.02 x 3.21 in, 102.0 x 81.5 mm
Displacement 244 in³, 3996 cm³
Compression Ratio 13.3:1
Fuel Delivery: direct injection
Valve Gear: double overhead cams, 4 valves per cylinder, variable intake- and exhaust-valve timing and variable intake-valve lift
Redline/Fuel Cutoff 9000/9000 rpm
Power 493 hp @ 8400 rpm
Torque 331 lb-ft @ 6750 rpm

Drivetrain
Transmission: 7-speed dual-clutch automatic
Final-Drive Ratio 4.17:1, helical-gear limited-slip differential

GEAR	RATIO	MPH PER 1000 RPM	MAX SPEED IN GEAR (rpm)
1	3.75	5.0	45 mph (9000)
2	2.38	7.9	71 mph (9000)

3	1.72	10.9	98 mph (9000)
4	1.34	13.9	125 mph (9000)
5	1.11	16.8	151 mph (9000)
6	0.96	19.5	176 mph (9000)
7	0.84	22.2	196 mph (8850)

Chassis
unit-construction
Body Material: aluminum and steel stampings and carbon-fiber-reinforced plastic

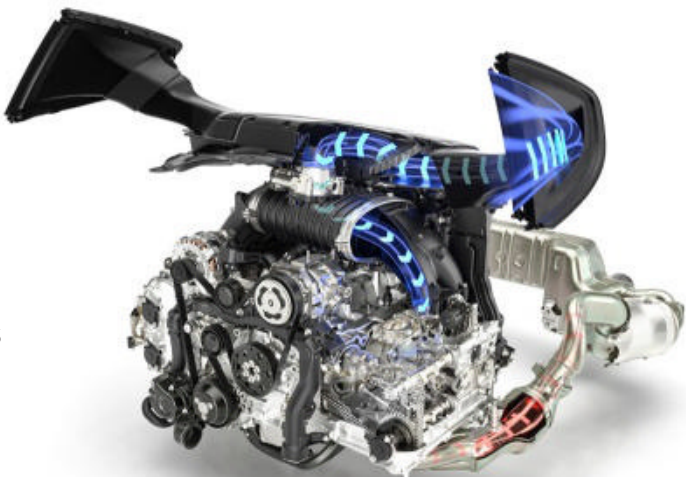
Steering
rack-and-pinion with variable ratio and variable electric power assist
Ratio 16.9-12.3:1
Turns Lock-to-Lock 2.6
Turning Circle Curb-to-Curb 37.4 ft

Suspension
F: ind; strut located by 1 diagonal link and 1 lateral link; 2 coil springs; 2-position electronically controlled dampers; 3-position anti-roll bar
R: ind; strut located by 1 trailing link, 1 lateral link, and a toe-control link per side; 2 coil springs; 2-position electronically controlled dampers; 3-position anti-roll bar

Brakes
F: 16.1 x 1.4-in vented, cross-drilled carbon-ceramic disc; 6-piston fixed caliper
R: 15.4 x 1.3-in vented, cross-drilled carbon-ceramic disc; 4-piston fixed caliper
Stability Control: fully defeatable, competition mode, launch control

Wheels and Tires
Wheels: forged magnesium **F:** 8.5 x 20 in **R:** 11.0 x 20 in
Tires: Michelin Pilot Sport Cup 2 R Connect
F: 245/35ZR-20 (95Y) N0
R: 295/30ZR-20 (101Y) N0

Dimensions
Wheelbase 97.8 in
Length 175.4 in
Width 71.7 in
Height 49.9 in
Front Track 60.8 in
Rear Track 60.7 in
Ground Clearance 4.0 in
Passenger Volume 49 ft³
Cargo Volume, F/R 4/5 ft³



BUCK UP
—
Twin antler-looking intakes come together at a common manifold before six throttle bodies feed the engine air at atmospheric pressure.

TEST RESULTS

Acceleration
30 mph 1.1 sec
40 mph 1.6 sec
50 mph 2.1 sec
60 mph 2.8 sec
70 mph 3.6 sec
80 mph 4.5 sec
90 mph 5.6 sec
100 mph 6.7 sec
110 mph 8.2 sec
120 mph 9.8 sec
1/4-Mile 11.0 sec @ 126 mph
130 mph 11.7 sec
140 mph 14.0 sec
150 mph 16.8 sec
160 mph 20.8 sec
Results above omit 1-ft rollout of 0.2 sec.

Rolling Start, 5-60 mph 3.8 sec
Top Gear, 30-50 mph 2.1 sec
Top Gear, 50-70 mph 2.1 sec
Top Speed (mfr's claim) 196 mph

Handling
Roadholding, 300-ft Skidpad 1.11 g
Understeer: minimal

Braking
70-0 mph 132 ft
100-0 mph 242 ft
Fade: none

Weight
Curb 3242 lb
Per Horsepower 6.6 lb
Distribution, F/R 43.5/56.5%

Fuel
Capacity 16.9 gal
Octane 93

C/D Fuel Economy
Observed 16 mpg

EPA Fuel Economy (C/D est)
Comb/City/Hwy 16/15/17 mpg

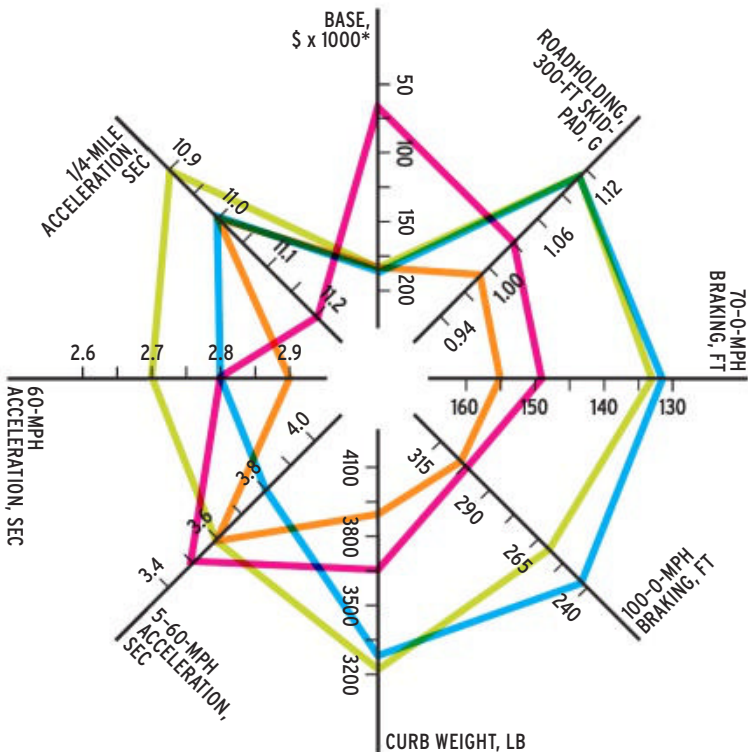
Interior Sound Level
Idle 58 dBA
Full Throttle 102 dBA
70-mph Cruising 76 dBA

COMPETITORS

What more evidence is needed to prove we are in a golden age of internal combustion?

- Acura NSX Type S**
600-hp 3.5-L V-6 + AC motors, 9-sp auto
- Chevrolet Corvette Z51**
495-hp 6.2-L V-8, 8-sp auto
- Porsche 718 Cayman GT4 RS**
493-hp 4.0-L flat-6, 7-sp auto
- Porsche 911 GT3**
502-hp 4.0-L flat-6, 7-sp auto

*includes performance-enhancing options



GRÜN WITH ENVY

IT MAY SHARE
AN ENGINE
WITH THE
GT4 RS, BUT
A MANUAL
GT3 IS PROOF
THAT GETTING
INVOLVED IS
BETTER THAN
WORSHIPING
NUMBERS.

BY EZRA DYER
PHOTOGRAPHY BY
MARC URBANO



THE 2022 PORSCHE 911 GT3 has one analog gauge: the tachometer. It's huge, dead ahead through the steering wheel. And if you spec the GT3 with the six-speed manual transmission, it's a vital instrument. Because unless you own an early Honda S2000 or some type of Hayabusa-engined Ford Festiva, you're probably not accustomed to 9000-rpm gearchanges. Rely on your ear and you might grab a gear at 7000 rpm—which is seriously short shifting. So you keep that tach in your peripheral vision, and when the yellow lights start to flash alongside it, your left foot goes to the clutch and your right hand to the shifter. At 9000 rpm, the 502-hp 4.0-liter flat-six sounds like it's trying to overtake the car itself. It's as if the GT3 Cup engine were back there. Which, of course, it mostly is.

The GT3's six-speed manual is a different animal from the seven-speed manual in other 911s, tracing its lineage to the 911 R. The shifter is gloriously easy to slot into place, somehow frictionless until the soft crunch of engagement tells you that you've hit the next gear. Revs climb—and fall off—instantly, as if the 4.0-liter has a fidget spinner for a flywheel. Mundane chores like parallel parking inevitably attract lookie-loos, so keep those revs up. Stalling a GT3 is almost as bad as stalling an airplane, in terms of embarrassment if not consequences.

The 911 GT3 manual has one cupholder, directly in front of the shifter. Do not use the cupholder.

In Normal drive mode, you can try to rev-match downshifts yourself. In Sport and Track modes, the car does it

for you. Reverse is up and to the left of first gear, and its detent is not exactly a seven-foot-tall bouncer with brass knuckles. Tip: If you think you're in first gear but the backup camera is on, best check your work before dropping the clutch.

Grab a perfect launch and the six-speed GT3 will rip to 60 mph in 3.3 seconds and through the quarter-mile in 11.5 seconds at 124 mph. Those are great numbers, but far in arrears of the automatic car's 2.7-second zero-to-60 time and 10.9-second quarter-mile at 129 mph. In choosing the manual, you are deliberately selecting the car with inferior straight-line performance. And why would you do that?

Well, because you can spare a half-second here or there in the name of glorious mechanical involvement. And because with a manual, this car draws a straight line back to the first 911s, except it's so much better. Plus, there's the snob appeal. The GT3 is its own exclusive club, and the manual GT3 is the roped-off VIP area inside that. No poseurs allowed.

While the manual costs \$0, it should be a statement credit. But that is an accounting oversight we can stomach, especially when it feels like a bargain.

THE NUMBERS

Vehicle Type: rear-engine, rear-wheel-drive, 2-passenger, 2-door coupe

Base/As Tested \$164,150/\$197,935

Engine: DOHC 24-valve flat-6, aluminum block and heads, direct fuel injection

Displacement 244 in³, 3996 cm³

Power 502 hp @ 8400 rpm

Torque 346 lb-ft @ 6100 rpm

Transmission: 6-speed manual

Dimensions

• **Wheelbase** 96.7 in

• **L/W/H** 180.0/72.9/50.4 in

• **Curb Weight** 3199 lb

TEST RESULTS

60 mph 3.3 sec

100 mph 7.5 sec

1/4-Mile 11.5 sec @ 124 mph

130 mph 12.5 sec

150 mph 18.2 sec

Results above omit 1-ft rollout of 0.3 sec.

Rolling Start, 5-60 mph 4.2 sec

Top Speed (mfr's claim) 199 mph

Braking, 70-0 mph 134 ft

Braking, 100-0 mph 262 ft

Roadholding, 300-ft Skidpad 1.16 g

EPA Fuel Economy

• **Comb/City/Hwy** 16/14/18 mpg

AT THE WHEEL



Andreas Preuninger, director of the GT model line, started with the GT group in 2000 and is responsible for developing the Porsches of Porsches. Under his watch, the GT group has produced a greatest-hits catalog of multiple GT3 generations, the GT3 RS and GT2 RS, and the Cayman GT4. We had a few questions for him, including one about his Ram pickup.

C/D: What is at the core of the cars built by Porsche's GT group?

PREUNINGER: A GT car should be one that "talks" to the driver, making [them] an integral part of the performance system and offering a maximum of usable feedback, and should be a feast for all senses at the same time. After getting out of a GT car, the driver must feel that urge to turn around and look at it again while walking away. So it must be the best-looking car within its range, with an unmistakable Porsche GT look that is highly functional as well as beautiful. Lightweight construction and purity are an important part of the GT recipe, too, since you notice weight whenever the car is moving, even at slow speeds. Handling must be confidence-inspiring with an easy controllability even beyond the limit. Being a motorsport product, it has to have the pole-position attitude and a lead regarding lap times even against higher-powered offerings from the competition. And it should sound right.

■ **Has there been any resistance to Caymans that outperform 911s?**

■ Not at all. We make the most of each project and are not afraid to push the limits, even if it means encroaching on cars we have developed. We always want the next car to be the best one. We don't consider the GT4 RS to be a competitor with non-GT 911s. It's too different in look and feel and is built for a different purpose.

■ **Will your group ever do an SUV?**

■ I use a Cayenne GTS as my daily driver and am mightily impressed

by the performance of the Turbo GT. But GT cars being developed by Porsche Motorsport always have their roots in racing or have a racing sibling, like GT3 Cup or GT4 Clubsport, so there would need to be a Cayenne racing somewhere for us to have a baseline to go from. Never say never, but right now our engineering capacity and racing activities do not enable us to pursue such a step.

■ **Will electrification be brought into the GT group?**

■ Well, time will tell. At the moment, we are pretty busy with the next exciting GT products in the pipeline.

■ **How important is the role of the manual within the GT group?**

■ With cars like the 981 GT4 or the 911 R, we saw the interest for a manual. So since then, we aim to offer the choice to cater to both track rats and enthusiasts who want to savor the experience of a manual, and we hope to do so as long as regulations allow and there is interest from customers.

■ **Has owning a Ram pickup made you look at sports cars differently?**

■ No, not really. I would say it's reaffirmed my belief that a car doesn't necessarily need to be perfect in every way, but it should be exciting, entertaining, engaging, and put a smile on your face. There's more than one way to achieve that, and I was always a fan of big V-8s and the American way of driving. As different as it may seem from driving a GT car, I will always try to have both kinds of cars in my garage.



Challeng Establis



GENESIS'S NEW LUXURY COMPACT CROSSOVER, THE GV70, MADE A BOLD ENTRANCE. NOW IT FACES OFF AGAINST SEGMENT LEADERS FROM BMW AND LEXUS.

By Mike Sutton Photographs by Marc Urbano and Michael Simari

ing the hmmment



B

uyers can't get enough of leather-lined compact SUVs with status badges, which are now the core of the premium-car market.

While consumers are giving up some of the performance and handling of sedans, the demand for wagon-like versatility and an above-the-cars seating position has propelled these SUVs to prominence. Into this white-hot arena Genesis throws its new GV70 crossover, arguably the most important product yet from Hyundai's nascent luxury brand.

Unfortunately, the vast number of vehicles in this segment is matched by the vast scope of the auto industry's supply disruptions. Vehicle shortages made a giant comparison test impossible. Instead, we opted to take the

GV70's measure against two SUVs that have long stood as templates for the segment: the BMW X3 and the Lexus RX.

Most entries in this segment kick off just north of \$40K. But all-wheel drive, six-cylinder power, and a long list of extras pushed our average as-tested price to \$64,243, with our three competitors separated by a slim \$1930. The price point works in the GV70's favor, as that money will buy the top Sport Prestige model fitted with the optional 375-hp twin-turbo 3.5-liter V-6 and nearly every imaginable feature, from leather-and-suede seats to a head-up display.

Lexus started this automotive genus when it launched the RX300 for 1998. Easygoing refinement and proven reliability—plus annual sales that regularly top 100,000—have been the RX's hallmarks ever since. Its current fourth generation also pushes the boundaries of tasteful SUV exterior design and offers both conventional and

hybrid powertrains. We settled on the RX350, powered by a standard 295-hp 3.5-liter V-6 and dressed in optional F Sport regalia.

The BMW X3 M40i serves as the other bookend. Decidedly more performance oriented than the Lexus, the Bimmer features a 382-hp sweetheart of a turbocharged 3.0-liter inline-six and convincingly upholds the notion that this is a 3-series wagon writ taller.

Our trio assembled, we bolstered our usual back-road shakedown with the highway runs and urban crawls that are the real life of SUVs. With test results and interior measurements in hand, the GV70's place on the spectrum came into focus.



2022 Lexus RX350 AWD F Sport

Plus Quiet, fuel efficient, pleasant ride quality.
Minus Not interested in being fun to drive, aging interior, annoying touch-pad interface.
Equals A popular luxury appliance that's due for an update.

	2022 BMW X3 M40i	2022 Genesis GV70 3.5T Sport AWD	2022 Lexus RX350 F Sport AWD
Base/As Tested	\$58,795/\$64,995	\$54,195/\$64,670	\$53,295/\$63,065
Dimensions			
Wheelbase	112.8 in	113.2 in	109.8 in
Length/Width/Height	185.9/74.4/66.0 in	185.6/75.2/64.2 in	192.5/74.6/67.7 in
Track, F/R	63.2/63.6 in	64.6/65.2 in	64.4/64.0 in
Passenger Volume, F/R	55/45 ft ³	56/48 ft ³	58/50 ft³
Cargo Volume Behind, F/R	63/29 ft³	57/29 ft ³	33/16 ft ³
Towing			
Max	4409 lb	3500 lb	3500 lb
Powertrain			
Engine	turbocharged DOHC 24-valve inline-6 183 in ³ (2998 cm ³)	twin-turbocharged DOHC 24-valve V-6 212 in ³ (3470 cm ³)	DOHC 24-valve V-6 211 in ³ (3456 cm ³)
Power, hp @ rpm	382 @ 6500	375 @ 5800	295 @ 6300
Torque, lb-ft @ rpm	369 @ 1800	391 @ 1300	267 @ 4700
Redline/Fuel Cutoff	7000/7000 rpm	6250/6250 rpm	6500/6500 rpm
lb per hp	11.5	12.2	15.7
Driveline			
Transmission	8-speed automatic	8-speed automatic	8-speed automatic
Driven Wheels	all	all	all
Final-Drive Ratio:1	3.39	3.91	3.33
Chassis			
Suspension	F: struts, coil springs, anti-roll bar R: multilink, coil springs, anti-roll bar	F: struts, coil springs, anti-roll bar R: multilink, coil springs, anti-roll bar	F: struts, coil springs, anti-roll bar R: multilink, coil springs, anti-roll bar
Brakes	F: 13.7-in vented disc R: 13.6-in vented disc	F: 14.2-in vented disc R: 13.6-in vented disc	F: 12.9-in vented disc R: 13.3-in vented disc
Stability Control	fully defeatable, traction off, launch control	fully defeatable, traction off, launch control	partially defeatable, traction off
Tires	Bridgestone Alenza 001 RFT F: 245/45R-20 103W ★ R: 275/40R-20 106W ★	Michelin Primacy Tour A/S 255/40R-21 102W M+S GOE	Michelin Premier LTX 235/55R-20 102V M+S
TEST RESULTS			
Acceleration			
30 mph	1.4 sec	1.6 sec	2.2 sec
60 mph	4.1 sec	4.6 sec	6.7 sec
100 mph	11.1 sec	12.0 sec	17.7 sec
130 mph	21.2 sec	22.8 sec	37.8 sec
1/4-Mile @ mph	12.8 sec @ 107 <i>Results above omit 1-ft rollout of 0.2 sec.</i>	13.2 sec @ 104 <i>Results above omit 1-ft rollout of 0.3 sec.</i>	15.1 sec @ 93 <i>Results above omit 1-ft rollout of 0.3 sec.</i>
Rolling Start, 5-60 mph	4.9 sec	5.4 sec	7.1 sec
Top Gear, 30-50 mph	2.5 sec	2.9 sec	3.5 sec
Top Gear, 50-70 mph	3.1 sec	3.8 sec	5.0 sec
Top Speed	155 mph (mfr's claim)	150 mph (C/D est)	132 mph (gov ltd)
Chassis			
Braking, 70-0 mph	158 ft	167 ft	178 ft
Roadholding, 300-ft Skidpad	0.88 g	0.86 g	0.82 g
Weight			
Curb	4378 lb	4583 lb	4623 lb
Distribution, F/R	50.7/49.3%	52.6/47.4%	57.5/42.5%
Fuel			
Capacity/Octane	17.2 gal/91	17.4 gal/91	19.2 gal/91
EPA Comb/City/Hwy	23/21/26 mpg	21/19/25 mpg	22/19/26 mpg
C/D 200-mi Trip	20 mpg	17 mpg	20 mpg
Practical Stowage			
No. of 9 x 14 x 22-in Boxes behind F/R	24/8	22/7	26/9
Length of Pipe	129.0 in	127.0 in	128.0 in
Largest Flat Panel, L x W	67.6 x 43.3 in	67.9 x 40.3 in	73.2 x 45.7 in
Sound Level			
Idle/Full Throttle	40/80 dBA	36/77 dBA	42/77 dBA
70-mph Cruise	69 dBA	67 dBA	67 dBA



3rd Place: 2022 Lexus RX350 F Sport AWD

With the RX350 well down on horsepower and carrying the most mass, we were hardly surprised that the others left it in the dust when the accelerator hit the cut-pile carpet. At 6.7 seconds to 60 mph, it trailed both the GV70 and the X3 by more than two seconds. While we welcomed the linear power delivery and lovely induction honk of Lexus's naturally aspirated 3.5-liter V-6, its relatively high 4700-rpm torque peak and relatively low 267 pound-feet of torque mean it lacks the effortless low-end surge of modern turbocharged engines. An eight-speed automatic transmission tuned to race for top gear also kept any semblance of sportiness at bay. "There's no sense of urgency

The RX350's F Sport package dresses up the interior in what looks like sassy red cowhide but is actually a still-sassy synthetic material.

to any aspect of this thing," observed technical editor David Beard.

Indeed, with the smallest brakes and narrowest tires, the Lexus also lagged behind the others in stopping distances and cornering grip. Its mushy brake pedal, slow steering, and body roll in corners kept back-road speeds in check. Switching to the more aggressive Sport and Sport+ modes did little to pull the RX out of its slumber. Dropping \$1050 on the Handling package, which brings adaptive dampers to the largely ornamental F Sport trim, also failed to add significant sportiness.

Those dampers were likely tuned to provide cushiness, and we judged the RX to have the plushiest ride quality of the bunch. The transmission's affinity for top gear helped the RX350 tie the X3's 20 mpg for best observed fuel economy, and the quiet cabin matched the GV70's hushed sound readings at both full throttle and 70 mph. Outward visibility was deemed good, if not as expansive as in the thin-pillared Genesis, and all drivers found easy comfort in the F Sport's supportive front seats. The Lexus's largest-on-paper back seat, however, was the least comfortable, especially with three adults stuffed back there.

Despite our example's natty red seats and decent roster of tech and convenience features, the RX's biggest turnoffs are its aging interior and its infotainment system's unintuitive touchpad controller. Lexus is





2022 BMW X3 M40i

Plus Inline-six of the gods, convincingly sporty, surprisingly efficient. Minus Unyielding suspension, lacking in luxuries, the priciest here. Equals An awesome horse leading a stiff carriage.

finally addressing this ergonomic misstep in newer models and has added touchscreen functionality to the RX. But there are still signs of antiquity, from the CD player in the dash to the cruise-control stalk lifted from the 2007 Toyota 4Runner. Though undeniably appealing to the masses, the RX350 is clearly ready for a redesign.

2nd Place: 2022 BMW X3 M40i

Exercising the X3 M40i engenders deep fondness for the strength and turbine-like smoothness of its B58 turbocharged inline-six, which has a transformative effect on this unassuming crossover. Aided by a borderline-clairvoyant ZF eight-speed automatic, it blasted our test car to 60 mph in 4.1 seconds, gapping the GV70 by a half-second. Lag from the turbo is essentially nil, and a newly added 48-volt hybrid system recoups energy to help run the accessories and fill in what dips might exist in the engine's powerband. The M40i weighs a relatively svelte 4378 pounds—the lightest here by 205 pounds—and its as-tested fuel economy tied the far-less powerful RX350's.

The M40i's best-in-test results extend to its 158-foot stop from 70 mph and 0.88 g of skidpad grip, thanks to upgraded brakes, the optional electronically controlled limited-slip rear diff, and summer tires (the only vehicle here so equipped). Though the Bimmer was the clear winner at the test track, its on-road demeanor left us wishing for better steering and more suspension compliance. The X3 responds eagerly to inputs from the thick

steering wheel, but it proved too lifeless and quick off-center for some. As in the GV70, there are numerous settings to adjust its over-the-road character, but the M40i's Adaptive M suspension starts stiff and only gets stiffer as you cycle through the sportier settings that "may as well be labeled Viagra and Cialis," Beard quipped.

A refresh for '22 brings the BMW an even larger kidney grille and new headlights, taillights, and bumpers. Despite having the highest base and as-tested prices, our lightly optioned test car was the least inviting of the group, lacking available extras such as adaptive cruise control, wireless device charging, and a surround-view camera system. As in many current BMWs, the steering column does not tilt down far enough for some drivers, and the X3's front seats were chided for being hard, flat, and short on comfort.

The X3's hard-to-read digital gauges are an affront to old BMWs. Mocha Vernasca leather costs \$1450 and answers the question: What can brown do for you?



BMW's iDrive infotainment setup, which continues to improve with each iteration, is augmented by touch and gesture controls for the M40i's 12.3-inch center display, though its complex menu structure still has some of us gnashing our teeth.

While the strength of the M40i's powertrain put the X3 atop the fun-to-drive category, its performance bent exemplifies the inherent drawbacks and trouble with trying to get a tall and heavy SUV to dance like a sports sedan. The performance never quite measures up, and the day-to-day driving experience suffers.

1st Place: 2022 Genesis GV70 3.5T Sport AWD

With the GV70, Genesis essentially marries the poshness and clean design of the larger GV80 SUV with the behind-the-wheel verve of its smaller G70 sports sedan—both of which have been 10Best winners. The result is a compact SUV that blends style, comfort, and driving excitement. “Just an overall enjoyable and cohesive experience,” read one logbook comment.

Despite its all-season rubber, the sportiest GV70 is no slouch when asked to hustle. Our test car dashed to 60 mph in 4.6 seconds and gave up less than we expected to the summer-tire-wearing BMW on the skidpad and in our 70-to-zero braking test. The GV70's twin-turbo V-6 is down seven horses to BMW's inline-six and emits a more gravelly tone from its bazooka tailpipes. But an eight-speed automatic smoothly harnesses

the engine's 391 pound-feet of torque—the most in this test—and the GV70's drive modes can effectively alter its temperament from RX350 calm to M40i edgy.

Its steering is precise without feeling darty, and its taut roll resistance is accompanied by impressive compliance over shoddy pavement, even on the optional 21-inch wheels (20s are standard). Helped by adaptive dampers and the Sport Prestige package's electronically controlled rear differential, the GV70 hangs with the M40i on twisty two-lanes while remaining more composed than the BMW. The sacrifice comes at the premium pump, with our 4583-pound test car averaging just 17 mpg, which was 3 mpg less than the others.

It only takes a glance to appreciate the GV70's cabin. Sculpted forms, high-quality

The GV70's Sport Prestige package adds leather with grippy suede inserts that, along with those sassy red seatbelts, help hold you in place.



2022 Genesis GV70 3.5T Sport AWD

Plus Beautiful design throughout, solid performance, punches above its class. **Minus** Disappointing gas mileage, some ergonomic foibles, explaining Genesis to everyone. **Equals** Genesis did its homework and turned in a winner.



materials, and our tester’s blue leather seats with red stitching appear to have been pulled from a \$100,000 SUV. Some drivers struggled with the clickwheel controller for the 14.5-inch infotainment screen, deeming the BMW iDrive layout to be slightly handier. But there’s no question that Genesis does a better job of presenting

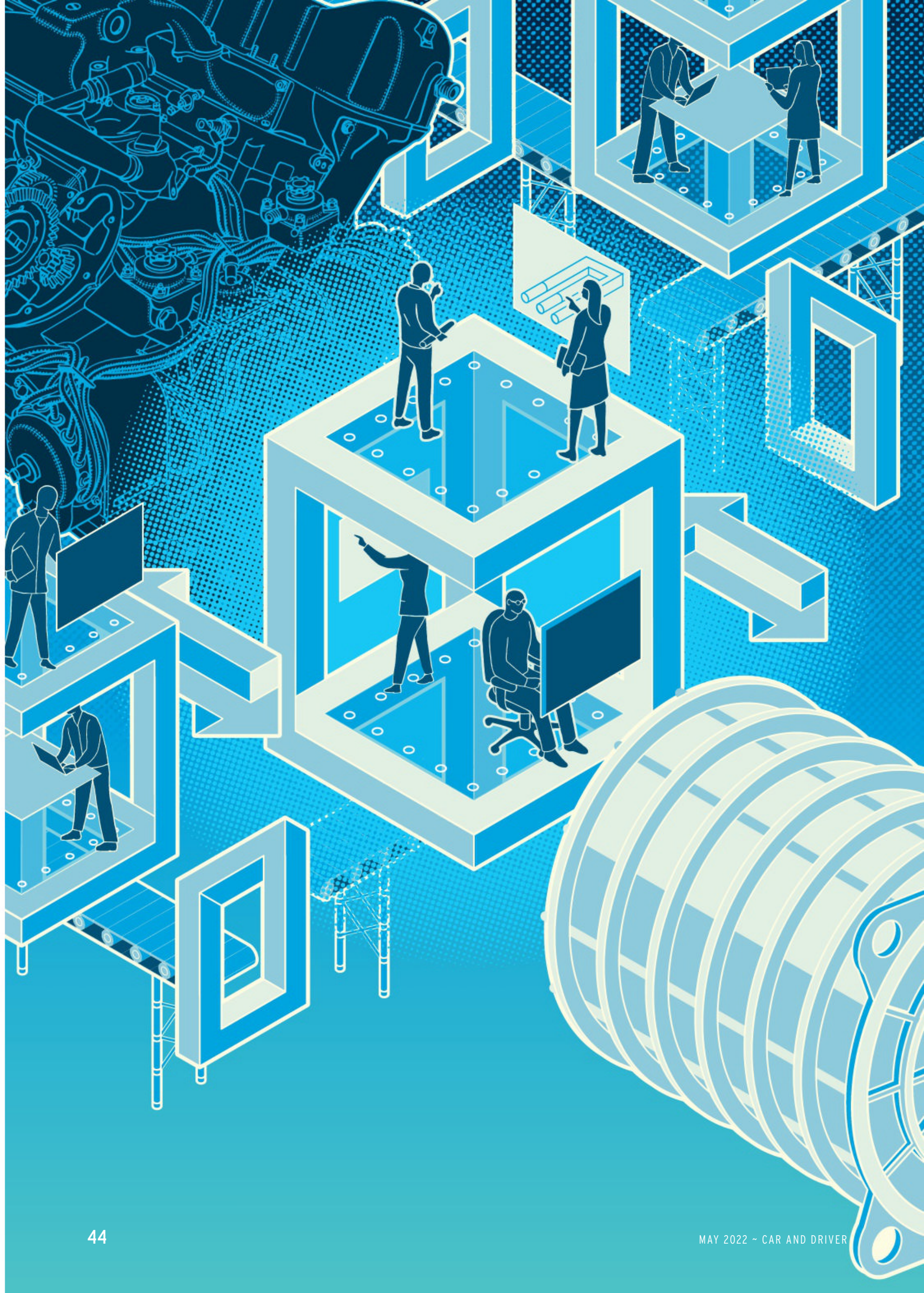
data and structuring its menu. The Sport Prestige trim level, a \$9900 assortment of goodies, bundles a surprisingly capable hands-free driving assistant, a suede headliner, and a 12.3-inch digital instrument cluster, making the GV70 the clear winner on features and amenities. While both the BMW and the Lexus offer more generous cargo space, the Genesis still swallows seven carry-on bags behind its contoured rear seats, which were voted the comfiest and most supportive.

The GV70 artfully combines the RX’s coddling, softer side with a satisfying serving of the joyful sportiness and driving dynamics found in the X3 M40i. As a brand-building exercise, the GV70 is proof of concept that fusing design, materials, vehicle dynamics, luxury, and refinement is the way to make a mark in a crowded segment. The GV70 puts an exclamation point on Genesis’s ability to compete in the heart of the luxury market. 🇺🇸

FINAL RESULTS	Vehicle													Powertrain					Chassis					Experience		GRAND TOTAL
	DRIVER COMFORT	ERGONOMICS	REAR-SEAT COMFORT	REAR-SEAT SPACE*	CARGO BOXES*	FEATURES/AMENITIES*	FIT AND FINISH	INTERIOR STYLING	EXTERIOR STYLING	REBATES/EXTRAS*	AS-TESTED PRICE*	SUBTOTAL	1/4-MILE ACCELERATION*	FLEXIBILITY*	FUEL ECONOMY*	ENGINE NVH	TRANSMISSION	SUBTOTAL	PERFORMANCE*	STEERING FEEL	BRAKE FEEL	HANDLING	RIDE	SUBTOTAL	FUN TO DRIVE	
Maximum points available	10	10	5	5	5	10	10	10	10	5	20	100	20	5	10	10	10	55	20	10	10	10	10	60	25	240
1. Genesis GV70 3.5T	10	9	4	4	4	10	9	10	10	1	20	91	18	3	7	9	9	46	19	10	9	9	9	56	20	213
2. BMW X3 M40i	7	8	4	3	5	7	9	7	8	1	19	78	20	3	10	10	10	53	20	8	9	9	6	52	22	205
3. Lexus RX350 F Sport	9	7	3	5	5	7	8	7	6	1	20	78	9	4	10	7	7	37	17	7	7	7	10	48	15	178

*These objective scores are calculated from the vehicles’ dimensions, capacities, rebates and extras, and/or test results.





The automotive industry is facing a new battery-powered world. How fast is it coming, and how will it affect the engineers of today and tomorrow?

By Greg Fink
and Elana Scherr
Illustrations by
Carl Wiens



It's happened before.

A new technology comes in, and what seemed like it had always been and always would be quickly becomes old-fashioned, unwanted, and a hard way to earn a living. Just ask your friendly neighborhood milkman or the owner of a corner Fotomat. In transportation, where change generally comes slowly, automakers' recent declarations that they plan to stop developing internal-combustion engines (ICE) and pivot to electrified lineups represent a real sea change. Arguably, the last radical move in the automotive industry occurred in the 1980s, when fuel injection wiped out carburetors, which was prompted by emissions regulations and high fuel prices. Sound familiar?

There have been plenty of ICE advancements since then, but they've been largely incremental: more injectors, more turbochargers, more sensors everywhere. Nothing to force an engineer back to the classroom. Now a big wave is about to crash on the industry, and everyone can either surf it or drown. This is no big deal for folks in marketing, who love a fun new trend, or even those in design—electric platforms open up new spaces and shapes to play with. But what about those with “engine” right in their job title? Will engineers working on piston power find their careers stalling out like an emissions-era carburetor? Will students mid-degree find their diplomas as hard a sell as a steam car in 1930?

In 2021, CEO after CEO announced plans for electrification. The consulting firm McKinsey & Company predicts that EVs (battery and fuel-cell) will make up more than 40 percent

of new-car sales in the U.S. by 2030. They currently constitute less than 3 percent, which means a lot of models would need to be designed, engineered, and purchased in the next eight years.

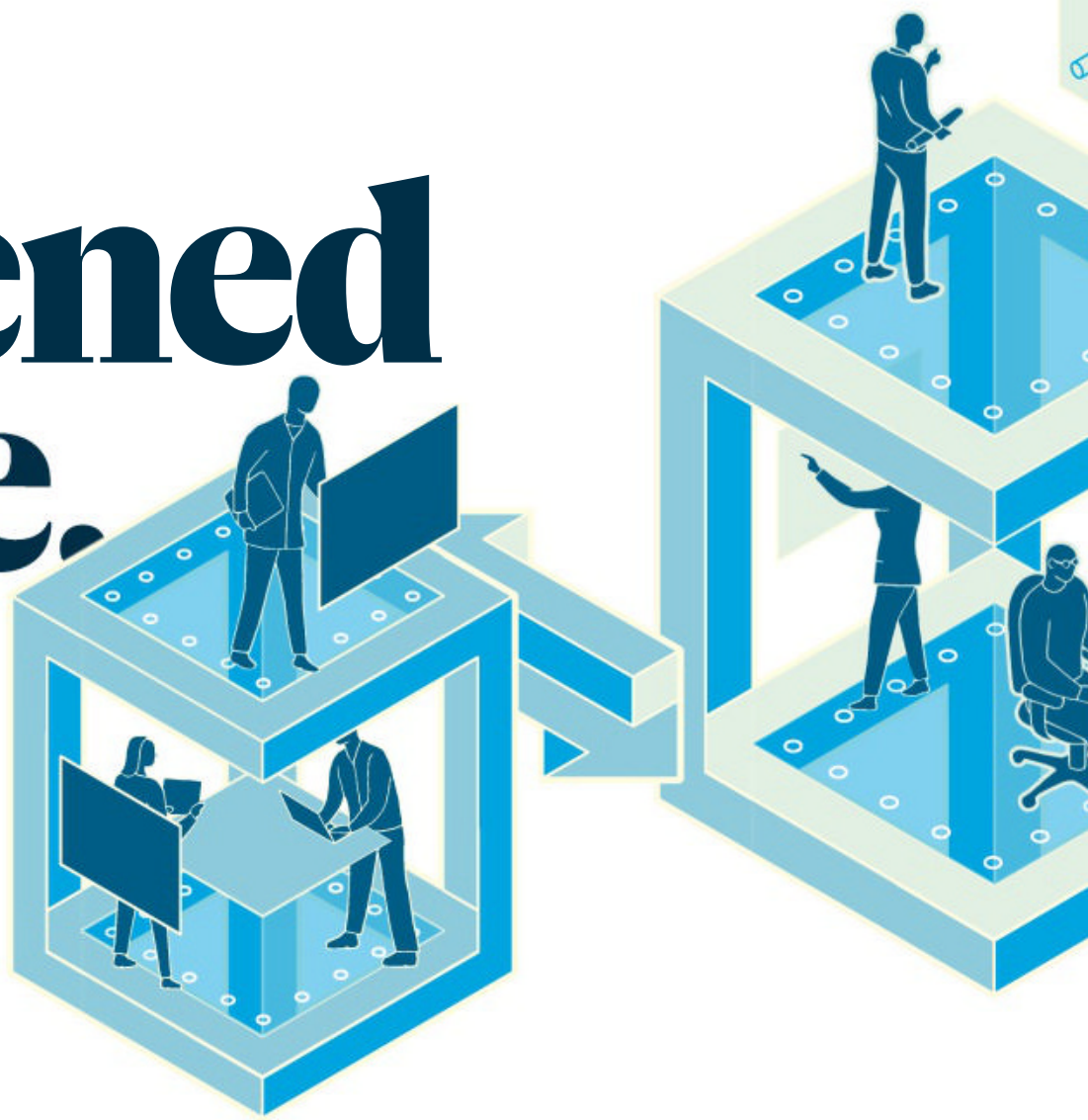
That will require some new hires, but it doesn't mean the old guard will be out on their ear. “If you're a good engineer, then you're going to be a good engineer on EVs,” says Ken Morris, vice president of electric and autonomous vehicles at General Motors. “We're bringing over engine engineers and transmission engineers, and we're converting them into EV engineers.”

Conversion happens through training programs, hands-on experience with electrified projects, and assurances that there is just as much opportunity in making fast EVs as there is in ICE performance. “This is a cultural change at AMG,” says Philipp Schiemer, CEO of Mercedes-AMG. “AMG was a very hardware-oriented company, and we are now moving toward being a software-driven company with electric motors. We have to take our employees with us on the journey. We are all petrolheads, but I

think we are making it clear that we have to go into the future. You ask, ‘Are people reluctant?’ I have to say, no, they understand. They are very performance oriented. They're interested in new technologies.”

Plenty of the old technologies are still at play. “There's a huge amount of mechanical engineering that goes into an EV,” says Chris Cowland, a former Fiat Chrysler powertrain director who is now a consultant at C Squared Engineering. “You've still got shafts that drive things. You've got brakes that slow the car down, cooling systems, heat exchangers. There's still going to be a load of work around all of that. In the OEMs, they're taking a lot of their most talented people who have run major programs and putting them on an EV powertrain program, because they understand about all the validation, how to prove everything works. If you talk to a bunch of engineers over a beer, they're going to tell you that physics is physics and chemistry's chemistry, and they can work on anything.”

Engineers can work on anything, but that doesn't mean they want to or that they all will be needed in a





post-ICE world. While a highly skilled powertrain lead may be in demand for work on an electric motor, a major car company may have hundreds of other positions specific to combustion, like testing emissions and tuning exhausts. Those skillsets won't be in demand if cars don't have tailpipes. As Cowland acknowledges, "All of those [activities] are going to go away in an EV world."

In a 2020 study commissioned by the Volkswagen Group, researchers in Germany looked at how the transition to EVs will affect employment in the automotive industry through 2030. They concluded that, overall, fears of large-scale job reduction will be mostly unwarranted. The study's authors, however, noted that the industry will experience "a complex, interconnected mixture of job creation, job upgrading, and job cuts."

This applies down the supply chain too. Companies need to adapt or they'll fold. In the 1980s, Rochester Carburetor switched to fuel injection. It's still in business. Carter Carburetor, on the other hand, was done in 1985. Right now ZF supplies gearboxes for millions of cars. What will happen to the German parts supplier in a world with vehicles that don't need more than a two-speed transmission, if that? Stephan von Schuckmann, member of the board of management of the ZF Group and head of its electrified-powertrain

technology division, says ZF is pivoting toward electrification, partnering with software and sensor companies, and moving away from development of ICE powertrain components.

It's also important to realize that if EVs account for 40 percent of new-car sales by 2030, then 60 percent will have a gas or diesel engine. So current engineers still have years of combustion engines ahead of them, even if those engines are partnered with motors or are smaller than the big mills we associate with performance cars today. Given that timeline, the people who will be most affected by the EV wave aren't legacy engineers, but those studying to work on cars.

Anna Stefanopoulou, a professor of mechanical engineering at the University of Michigan, is working with colleagues to change the ICE-heavy coursework for Wolverine students and others "so that the battery is everywhere," she says. Stefanopoulou's goal is to integrate battery-related, EV-applicable engineering principles into fundamental high-school and college courses, such as basic algebra and calculus, as a way of introducing the topic to younger and more generalized groups of students. That ought to better prepare them for all sorts of careers, be it as an EV engineer or an assembly-line worker building the cars.

Technician training is ahead of engineering in that sense. Tom Varrone, an instructor at the Phoenix campus of the Universal Technical Institute, says his school works with carmakers—he's part of a Ford program—to offer dealer-tech courses, which have expanded to electronics and software. Varrone says students are excited about the changes: "They see it as a chance to get a leg up in a new technology and impress those senior technicians that they'll go to work for."

Over at Cal State Long Beach, mechanical-engineering undergrad Garrett Walton is excited. "There is a lot of really cool stuff that's going to come out in the next couple of generations of EVs, and it would be a neat problem to work on solving," Walton says. He has shifted some of his classwork toward electrical engineering and software, but he says there

aren't enough EV-specific classes, so he does a lot of outside projects with programming and robotics.

A lack of hands-on training was a recurring theme with all the students we spoke with, many of whom mention Formula SAE, a race-car-building program run by SAE International, as one of their more valuable educational experiences. The University of Florida's Formula SAE team is preparing to trade its Honda motorcycle engine for an electric motor. "Part of me really will miss the noise of the ICE car, hearing the dyno run, and seeing the red-hot exhaust runners," says team president Mitchell Thoeni, a senior majoring in aerospace engineering. "But there's plenty to be excited for with the EV. The torque these things make and the engineering that goes into them is truly amazing."

Not everyone feels that way, of course. "If we went electric, I'd be bloody pissed off," says Remy Brooks-Johnson, who is studying motorsport engineering at Coventry University in the U.K. Brooks-Johnson says he'd rather work in the aftermarket or as a heritage mechanic than design electric cars, but he admits that it's probably smart to understand how they work.

Alexus Fraire-Gamell is approaching EVs from a practical standpoint. She is studying electromechanical systems engineering technology at Cal Poly Pomona and says that since electrification will undoubtedly have an impact on any engineering career, there's no point in wasting time fighting it. "EV tech is the evolution of what I love and am going to school for," she says. "Its domination seems inevitable. I'm happy to embrace it."

Change comes too soon for those who would prefer not to change at all and too slowly for those who worship the new. Electric-car tech will make waves in the long, placid lake of automotive engineering, but they are just ripples at the moment. We won't see a sudden thrash of mechanical engineers thrown overboard in the next five years or even the next 10. But the smart folks are brushing off their old copies of *The Electrical Engineering Handbook*, just to be ready for what happens after the wave crests. ■

AMERICANS OWN A LOT OF CRAP. SO MUCH, IN FACT, THAT THERE'S A WHOLE TV INDUSTRY DEVOTED TO OUR BOTTOMLESS APPETITE FOR ACQUISITION.

Pawn Stars, *American Pickers*, *Storage Wars*, *Hoarders*—these shows revolve around our possessions, how we accrue and dispose of them, how they come to rule our lives. For many of us, our mountainous volume of belongings outstrips the size of our homes (consider that construction of personal storage units increased 584 percent between 2015 and 2020). And if the junk has to go somewhere, it also has to get there. Which is why the hottest new economy car is a pickup: the 2022 Ford Maverick.

The Maverick's earnest usefulness seems to demand few sacrifices. Unibody with a strut front and torsion-beam rear suspension, it drives more like a Bronco Sport than a Ranger. The standard model is a hybrid with an EPA fuel-economy estimate of 37 mpg combined. Its base price is \$21,490, and the truck can tow 2000 pounds and haul 1500 pounds in its bed. The Maverick offers 191 horsepower in hybrid form and 250 horses with a turbo 2.0-liter four. So what's the catch? Why wouldn't you just buy one of these instead of, say, a Honda Civic? We were asking ourselves the same thing, so we decided to grab a \$26,645 Maverick XLT hybrid and a \$26,183 Civic Sport sedan and find out for ourselves whether Ford's small truck could make the small car obsolete.

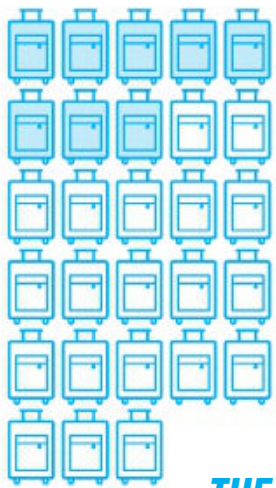
Redesigned for 2022 and just off a recent comparison-test win, the Civic is a lodestar for small-car excellence. It looks, drives, and feels expensive, yet its base price is \$23,365. You can tell that Honda has been in this game for a long time. Most cars around this price strive for nothing more than cheerful chintz inside, but the Civic Sport wants you to notice the metallic honeycomb spanning the dash, the softness of the leather wrapping the steering wheel, and the fact that the trunk-release button lights up, so you can rely on

sight, not feel, to find it. The Civic, as always, nails the details. The question is whether the Maverick delivers a broadly similar experience along with the ability to haul that irresistible Craigslist dinette set to the local U-Stor-It.

On a winding back road, it doesn't take long for the Civic to establish that "carlike," as applied to the Maverick, is relative. Fitted with 18-inch wheels and 235/40R-18 Goodyear Eagle Sport All-Season tires, the Civic pulls 0.87 g on the skidpad and feels willing to venture near that number whenever a suitable corner presents itself. Even fragged-out Michigan pavement can't knock it off its line once it takes a set; the suspension is stiff enough to keep body motions in check yet supple enough to soak up big hits.

Like any good consumer, we went on a Costco run to see what fits in each vehicle. It's no surprise that the Civic owner will have to leave a seriously fun evening of activities behind.





THE BAG MAN
We packed each vehicle full of carry-on-sized bags and found that the Maverick can hold 28 in the bed and rear seat. Fold the Civic's back seat and the car will carry 20 in relative security.

The Civic feels light and lithe, and it is, weighing in at 2906 pounds—814 pounds less than the Maverick.

The Maverick, by contrast, is like a big goofy dog trying to keep up with a greyhound, bounding and leaning and generally feeling distinctly unhappy at being hustled. Compared with the Civic, its 17-inch wheels are smaller and its 225/65R-17 sidewalls are taller, which helps make for a limber ride but adds another layer of squish in corners. The Maverick manages a not-terrible 0.81 g on the skidpad, but attaining that number requires torturing the front tires with drastic understeer. Even its plastic steering wheel discourages spirited driving, drawing one comment that read, “I’ve felt more luxurious steering wheels on a municipal golf course.”

When the road straightens, however, the Maverick regains some ground. While both Honda and Ford use a continuously variable automatic transmission (CVT), the Maverick’s 173 pound-feet of electric-motor torque helps get things moving while the 2.5-liter Atkinson-



2022 FORD MAVERICK XLT
HIGHS: EFFICIENT, INEXPENSIVE, CAN CARRY MANURE MUCH MORE ELEGANTLY THAN THE CIVIC.
LOWS: STILL MILDLY TRUCKISH HANDLING, CHEAPO INTERIOR, FUN-KILLING CVT. **VERDICT:** A GREAT LITTLE CAR THAT HAPPENS TO BE A TRUCK.

cycle inline-four climbs toward its 5600-rpm power peak. The Maverick’s 7.7-second sprint to 60 mph trounces the Civic’s 8.8-second run, and the chunky Ford beats the Honda in every other acceleration test too. From 50 to 70 mph, the Maverick is a full second quicker (4.7 seconds to 5.7 seconds), a margin that also applies to the quarter-mile (15.9 seconds at 90 mph versus 16.9 seconds at 86 mph). Should you keep the pedal pinned, the Maverick will require 27.3 seconds to reach 110 mph; the Civic, 32.0. As these numbers suggest, the Civic



The Maverick’s underseat storage is the only place in the little truck where you can hide your affinity for summer sausage and Doritos from judging eyes.



Filling a Maverick with dirt or mulch would be no problem. A Civic owner will have to buy their stuff bagged, which, let's be honest, isn't nearly as cool.



Sport's sportiness does not extend to its powertrain. In fact, the Civic Sport sedan comes only with the most milquetoast of Civic powertrains: a 158-hp naturally aspirated 2.0-liter inline-four paired with a CVT. With a mere 138 pound-feet of torque manifesting at 4200 rpm, the 2.0-liter takes a while to generate meaningful forward progress—the Sport's off-the-line lethargy earned it the nickname Less 2000. The Civic does have paddle shifters that let you choose from six preset ratios, and Sport mode keeps the 2.0-liter spinning above 3000 once you're on the move. Compared with the Maverick, the Civic has the sportier CVT. And an Irish funeral is probably more fun than most others, but you'd still rather be at a Dave & Buster's.



	2022 Ford Maverick XLT Hybrid	2022 Honda Civic Sport
Base/As Tested	\$23,855 \$26,645	\$24,765 \$26,183
Dimensions		
Length/Width/Height	199.7/72.4/68.7 in	184.0/70.9/55.7 in
Wheelbase	121.1 in	107.7 in
Track, F/R	63.4/62.8 in	60.0/61.6 in
Ground Clearance	8.3 in	5.3 in
Passenger Volume, F/R	54/ 46 ft ³	55 /44 ft ³
Bed or Trunk Volume	33 ft ³	15 ft ³
Payload Capacity	1500 lb	850 lb
Towing Capacity	2000 lb	—
Powertrain		
	DOHC 16-valve Atkinson-cycle 2.5-liter inline-4, 162 hp, 155 lb-ft + 2 AC motors, 126 hp, 173 lb-ft (combined output, 191 hp)	DOHC 16-valve 2.0-liter inline-4, 158 hp, 138 lb-ft
Lb per hp	19.5	18.4
Transmission	continuously variable automatic	continuously variable automatic
Driven Wheels	front	front
Final-Drive Ratio:1	2.91	3.94
Chassis		
Suspension	F: struts, coil springs, anti-roll bar R: torsion beam, coil springs, anti-roll bar	F: struts, coil springs, anti-roll bar R: multilink, coil springs, anti-roll bar
Brakes	F: 12.8-in vented disc R: 11.9-in disc	F: 11.1-in vented disc R: 10.2-in disc
Stability Control	traction off	partially defeatable
Tires	Continental ProContact TX 225/65R-17 102H M+S	Goodyear Eagle Sport All-Season 235/40R-18 91W M+S
TEST RESULTS		
Acceleration		
30 mph	2.9 sec	3.5 sec
60 mph	7.7 sec	8.8 sec
1/4-Mile @ mph	15.9 sec @ 90	16.9 sec @ 86
	Results above omit 1-ft rollout of 0.3 sec.	Results above omit 1-ft rollout of 0.4 sec.
Rolling Start, 5-60 mph	7.8 sec	9.1 sec
Top Gear, 30-50 mph	3.8 sec	4.3 sec
Top Gear, 50-70 mph	4.7 sec	5.7 sec
Top Speed	110 mph (gov ltd)	125 mph (C/D est)
Chassis		
Braking, 70-0 mph	158 ft	170 ft
Roadholding, 300-ft Skidpad	0.81 g	0.87 g
Weight		
Curb	3720 lb	2906 lb
Distribution, F/R	58.7/41.3	60.8/39.2
GVWR	5200 lb	3880 lb
Fuel		
Capacity/Octane	13.8 gal/87	12.4 gal/87
EPA Comb/City/Hwy	37/42/33 mpg	33/30/ 37 mpg
75-mph Hwy Driving	30 mpg	36 mpg
Hwy Range	410 mi	440 mi
Sound Level		
Idle/Full Throttle	33/72 dBA	40/84 dBA
70-mph Cruise	67 dBA	72 dBA

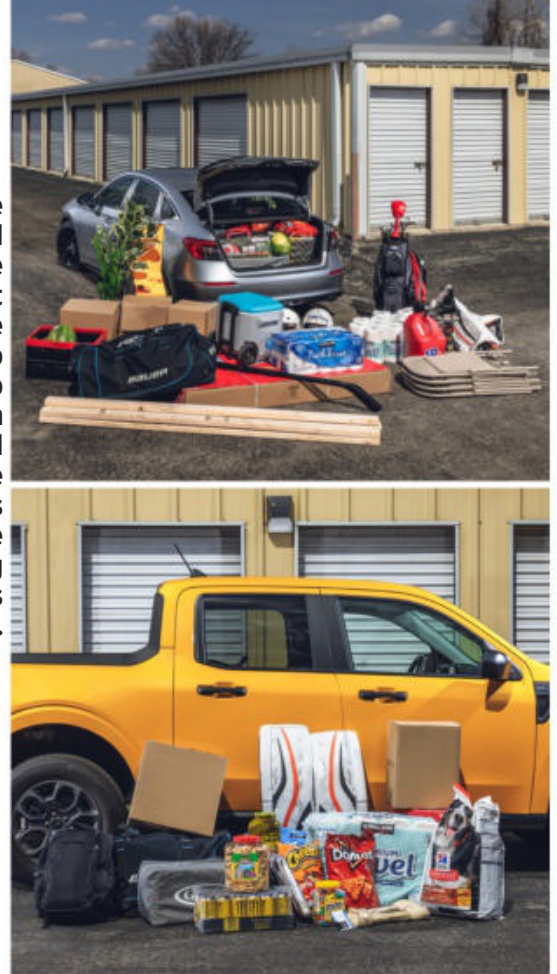


2022 HONDA CIVIC SPORT
HIGHS: BEAUTIFULLY EXECUTED
 INTERIOR, PLAYFUL HANDLING,
 SURPRISINGLY CAPACIOUS. **LOWS:** NO
 MANUAL TRANSMISSION, HPD
 PACKAGE PROMISES SPEED THAT'S NOT
 THERE, CAN'T TOW YOUR SEA-DOOS.
VERDICT: BUY THIS AND BORROW
 YOUR FRIEND'S RIDGELINE SOMETIMES.

We should note that this Civic Sport wore the Honda Performance Development cosmetic kit, a \$1418 package that brings lower-body appliques, a rear decklid spoiler, and an all-important HPD badge. It does not, as far as we could tell, make the car go faster. However, for \$182 more, you could upgrade to a Civic EX and its 180-hp turbocharged 1.5-liter four, a powerplant that gets the Civic to 60 mph in 7.5 seconds. Then again, if you spend an extra \$1085 on your Maverick, you could have the 250-hp turbocharged 2.0-liter four. Spend even more, and you could probably have a 1000-hp Chevy El Camino with an airbrushed unicorn on the hood, so maybe let's just quit the what-ifs and move on to cargo.

To put it in the simplest terms, the Civic is better at hauling people, and the Maverick is better at hauling stuff. But the Maverick's cargo-schlepping superiority isn't as dominating as expected. In a modified version of our stand-

If you choose to haul people in the rear seat and leave the stuff to the cargo areas, then you will find the Maverick's advantage for moving things grows.



ardized box test (we don't normally fill pickup beds with boxes), the Maverick held 28 boxes in its bed (filled to the rail) and back seat. The Civic swallowed a surprising 20 boxes with its rear seats folded. The Civic also has the advantage of its rear-located, lockable, out-of-sight, weatherproof storage compartment, which Honda calls a "trunk" and is quite a novelty these days. However, it will be much more difficult, and certainly messier, to stuff a Yamaha YZ250 dirt bike into the Honda—advantage Maverick here. Ditto with towing, moving grandfather clocks, and sitting on the tailgate and drinking a thermos of coffee while wearing a hard hat. We're afraid you'll need the truck for that.

But if your cargo, like Soylent Green, is people, the Civic is the machine you want. Its seats, both front and rear, are all-day comfortable, while the Maverick's front seats lack thigh support and the back one is overly upright. The Civic's softer interior materials seem to translate to better sound quality in the cabin, despite the decibel meter's insistence that the Maverick is actually quieter. And for that piece of cargo known as the driver, the Civic wants to make life a little smoother with keyless start and adaptive cruise control, both of which our Maverick lacked.

We can't deny the Maverick's utility, but after hours behind the wheel of both vehicles, we realized that the mini-truck isn't quite the no-brainer choice it seems on paper. To attain that all-important bed, you sacrifice comfort, refinement, and handling—to an extent that becomes obvious once there's a Civic alongside. But those are differences of degree, not of kind, and the Maverick can still function as a car a lot more effectively than the Civic can function as a truck. If your life includes a lot of things, then the Maverick might be one more thing you need. 🇺🇸





A ROAD & TRACK EXPERIENCE

Hudson Quattrocento

OCTOBER 19-22, 2022

A fine autumnal tour through the
Northeast celebrating *Road & Track*
Performance Car of the Year finalists



**BECOME A TRACK CLUB MEMBER TODAY FOR FIRST
DIBS BEFORE REGISTRATION IS OPEN TO THE PUBLIC.**



**JOIN THE CLUB AT
[ROADANDTRACK.COM/TRACK-CLUB](https://roadandtrack.com/track-club)**

WE'LL HELP YOU GET THERE

Paved streets or the road less traveled –
make the most of your drive.



THE WAY TIRE BUYING SHOULD BE®



THE TIRE DECISION GUIDE

Answer just a few questions.
We'll narrow it down to the
one tire that's right for you.

www.tirerack.com/tdg



FREE 2-YEAR ROAD HAZARD PROTECTION

Now Includes Roadside Assistance

www.tirerack.com/rhp

FAST, FREE SHIPPING*

Over **90%** of orders leave
our distribution centers the
same day they are placed.



QUICK DELIVERY

We deliver to over **80%**
of the US population
in **one day**.



CONVENIENT INSTALLATION

See your local installation options.

www.tirerack.com/installer



FAST FREE SHIPPING on All Orders Over \$50*



OZ Alleggerita HLT 16 17 18 OZ Gran Turismo HLT 19 20 OZ Hyper GT HLT 17 18 19 20 OZ Leggera HLT 18 19 20 21 OZ SUPERTURISMO AERO HLT 18 19 20 OZ Ultraleggera HLT 19 20 TSW Clypse 18 19 20 22



Enkei Perf. EDR9 15 16 17 18 Enkei Perf. EKM3 17 18 Enkei Perf. GW8 17 18 Enkei Perf. PX-10 16 17 18 19 Enkei Perf. SS05 17 18 Enkei Perf. XM-6 17 18 20 TSW Pescara 18 19 20



Sparco Assetto Gara 15 16 17 18 19 20 Sparco DRS 17 18 19 Sparco Pro Corsa 17 18 Sparco Record 17 18 19 Sparco Dakar 17 18



Sparco Terra 15 16 17 18 Borbet Type F 15 16 17 18 Borbet Type RE 16 17 18 Borbet Type W 15 16 17 18 19 20 Borbet Type Y 16 17 18

See Them on Your Vehicle!



Enter your vehicle at tirerack.com to experience one-click access to everything that fits it.

What About TPMS?

We can assist you in selecting wheels that are compatible with your vehicle's sensors. We also offer an extra set of sensors for all TPMS systems, so your tire and wheel package can arrive with sensors already installed.

VOLVO

40K

Long-Term Test

AFTER TRACKING EVERY CHARGE,
SERVICE, PROBLEM, COMPLAINT, DENT,
AND DOG HAIR, CAR AND DRIVER
PRESENTS THE 40,000-MILE
EVALUATION.

— 2019 —

TESLA MODEL 3



BEYOND THE NOISE. BY DAVE VANDERWERP



We ordered a long-term Tesla Model 3 for one primary reason: to be able to report on using Tesla's Full Self-Driving software over time. Well, the joke's on us, because after we spent \$6000 on that option (the price is now double that) in 2019, our car came and went without ever getting it. Paying for an option we didn't receive is definitely a first, one of many when it came to the Model 3. Had we instead invested that money in Tesla stock, we could've cashed out with as much as \$150,000. Another new experience was being alerted via a mobile app that our car had a catastrophic breakdown while parked. Other than that biggie, which required a new \$2500 rear-motor assembly that was replaced

under warranty, our car had no major mechanical issues. After coming to terms with the minimalist interior and lack of gauge-cluster display in front of the driver, we generally liked the Model 3. It's quick, reasonably spacious, and comfortable if a bit noisy over the road.

This was only our second long-term EV ever. The previous one was a Model S five years ago, back when Tesla service was white glove and Supercharging was free. A lot has changed since then, and today there's much more noise about EVs as well as bold claims about the cost (or lack thereof) of charging and service. What follows is a series of things to know regarding both Tesla and EV ownership before you decide to take the plunge.

ARRIVAL

OCTOBER 2019

DEPARTURE

SEPTEMBER 2021



Rants and Raves

Adjusted hood grommets to level the hood. As delivered, the driver's side was lower than the passenger's.

—MIKE SUTTON

Tesla's auto wipers are noticeably less effective than the systems offered by, well, every other carmaker.

—ERIC TINGWALL

There's a lot of road noise, and the ride feels stiffer than our M340i's.

—ERIC STAFFORD

EFFICIENCY IS EXTREMELY VARIABLE

An electric vehicle's efficiency varies dramatically with outside temperature (internal-combustion efficiency also varies but to a much smaller degree). For example, in our best month, August 2020, we averaged 107 MPGe over 1812 miles. Our worst was February 2021, when we averaged 55 MPGe, almost 50 percent worse, over 1182 miles. The difference? The average temperature in February was 27 degrees, while in August it was a balmy 79. Cold temperatures obviously work the cabin heater more and also make charging less efficient. Even parking outside in wintry weather uses energy to keep the pack from getting too frigid. On one bitterly cold night when the mercury dipped down to 5 below zero, the Model 3 consumed 5 percent of its battery capacity just sitting overnight trying not to freeze.

CHARGING COSTS VARY WIDELY TOO

Filling the Model 3 from completely empty to full sometimes cost as little as \$12. It also could cost as much as \$32. The difference boils down to whether we were using cheaper electricity to slowly charge at home or the office, or charging faster at one of Tesla's Superchargers. How much you plan to fast-charge makes a huge

2019 TESLA MODEL 3 LONG RANGE DUAL MOTOR

Vehicle Type: front- and mid-motor, all-wheel-drive, 5-passenger, 4-door sedan

Base/As Tested \$49,690/\$57,690

Front Motor: induction AC, 184 hp, 177 lb-ft

Rear Motor: permanent-magnet synchronous AC, 241 hp, 298 lb-ft

Battery Pack: liquid-cooled lithium-ion, 79.2 kWh

Transmissions: direct-drives

Dimensions

- **Wheelbase** 113.2 in
- **L/W/H** 184.8/72.8/56.8 in
- **Curb Weight** 4038 lb

Warranty

4 years/50,000 miles bumper to bumper

8 years/120,000 miles powertrain

12 years/unlimited miles corrosion protection

4 years/50,000 miles roadside assistance

Model-Year Changes

2020: Wireless phone charging was added; rear-seat plugs became USB-C.

2021: A Model 3 facelift involved small changes, including thicker side glass, a heat pump to replace the less efficient resistive heater and conventional A/C, and removal of the radar sensor. The 263-mile Standard Range Plus was the only rear-drive option, and the AWD Long Range upped its EPA range to 353 miles.

2022: Standard Range Plus is renamed simply Rear Wheel Drive, with a 272-mile EPA range and a new lithium-iron-phosphate battery.

TEST RESULTS

	New	40,000
60 mph	4.1 sec	4.0 sec
100 mph	9.7 sec	9.1 sec
1/4-Mile	12.6 sec @	12.3 sec @
	112 mph	115 mph
130 mph	18.1 sec	16.7 sec
<i>Results above omit 1-ft rollout of 0.3 sec.</i>		
Rolling Start,		
5-60 mph	4.2 sec	4.0 sec
Braking, 70-0 mph ...	172 ft	159 ft
Roadholding,		
300-ft Skidpad	0.87 g	0.89 g
Top Speed (gov ltd)	145 mph	
C/D Fuel Economy		
• Observed	83 MPGe	
EPA Fuel Economy		
• Comb/City/Hwy	116/120/112 MPGe	
• Range	310 mi	



impact on the economics of EV ownership, and savings don't really materialize unless you have a regular Level 2 hookup at home (ideally, you have Level 2 capability at work too). For example, charging with home electricity during our most efficient month works out to a cost of just 4 cents per mile, while paying Supercharger prices during our least efficient month works out to 22 cents per mile. The former handily beats fueling up any gas-powered car, but the latter doesn't, even with the latest spike in prices at the pump. Our overall 83 MPGe average, achieved over a 57/43 percent split in favor

of home charging (we expect most owners to do far more charging at home), equates to a cost of 8 cents per mile—on par with a car running on regular gas and getting 50 mpg.

Left: Look, ma, no hands. Above: Supercharging was once free. Use it exclusively and you'll pay more than a Camry driver does for gas.

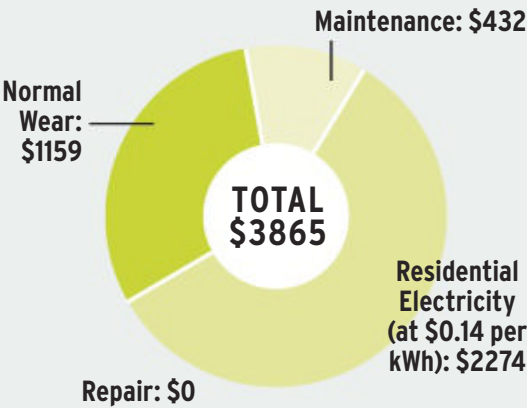


The Electric Factory

SERVICE

Dealer Visits	
• Scheduled	3
• Unscheduled	2
Days out of Service	8
Damage and Destruction	\$2400

OPERATING COSTS FOR 40,000 MILES



SERVICE TIMELINE

October 8, 2019 68 miles Long-term test begins.	July 28, 2020 14,938 miles Dealer replaced cracked windshield as well as fixed misaligned B-pillar trim under warranty. \$1088	May 19, 2021 32,161 miles Dealer lubricated brake calipers and rotated tires. \$119
December 3, 2019 4107 miles Swapped to Michelin X-Ice Xi3 winter tires in C/D garage. \$0	November 4, 2020 21,534 miles Dealer lubricated brake calipers and rotated tires. \$103	June 2, 2021 33,497 miles Dealer replaced front parking sensor after impact with road debris. \$116
December 25, 2019 5286 miles Model 3 stranded us on Christmas morning. Towed to service center, where dealer replaced rear-motor assembly, high-voltage battery's pyrotechnic fuse, 12-volt battery, and underbody aero panel under warranty. \$0	November 24, 2020 21,843 miles Swapped to winter tires in C/D garage. \$0	June 8, 2021 33,964 miles Dealer replaced cracked glass roof. \$1196
April 15, 2020 10,627 miles Swapped to OEM all-season tires in C/D garage. \$0	December 18, 2020 22,892 miles We replaced the key fob's CR2032 battery after a dashboard warning light alerted us it was low. \$2	July 14, 2021 35,676 miles Installed new Tesla-spec Michelin Pilot Sport 4 tires in C/D garage. \$1157
May 26, 2020 11,828 miles Dealer lubricated brake calipers and rotated tires. \$210	March 29, 2021 25,575 miles Swapped to OEM all-season tires in C/D garage. \$0	September 28, 2021 40,422 miles Long-term test ends.

LIFE EXPECTANCIES

Tires	30,000 miles
Brake Pads	
• Front	more than 100,000 miles
• Rear	more than 100,000 miles

WHAT BITS AND PIECES COST

Headlamp	\$970
Wheel	\$350
Tire	\$287
Wiper Blades	\$50
Front Brake Pads	\$220

TOTAL ENERGY



We pumped 16,470 kilowatt-hours into our Model 3. The actual cost was \$3413, or 67 percent higher than the operating cost we cite above. That's because we used far-pricier Supercharging for 43 percent of our energy, and Michigan's residential electric rates are slightly higher than the national average used in our projection.



Rants **and** **Raves**

The Supercharging infrastructure is better than the car.

—EDDIE ALTERMAN

The ride, handling, steering, and power make the Model 3 really fun. I enjoy driving it more than any BMW 3-series of recent memory. But the rattles and squeaks emanating from the instrument panel at this early stage make you wonder about long-term reliability.

—RICH CEPPOS

Just coasted in on whatever's the EV equivalent of fumes because the Model 3 lost 40 miles of range while parked all day. WTH?

—DREW DORIAN

SERVICE COSTS AREN'T TRIVIAL

The Model 3 has minimal scheduled service. However, one regional requirement that applies to us is lubricating the oft-dormant brake calipers every year or 12,500 miles in areas where roads are salted during winter. Those three lubes each cost oil-change money, totaling \$306. But our car's minuscule brake wear over 40,000 miles suggests the pads should last well past 100,000 miles. The Model 3's all-season Michelin tires, on the other hand, were used up after just 30,000 miles, partially because the Tesla version of this tire has less tread depth, probably for a slight boost in efficiency and range. A new set was \$1157. Although not technically service costs, replacing the \$1088 windshield and later the \$1196 glass roof due to stone chips lightened our pockets as much as damage and destruction incidents in other long-term test cars.



Baubles and Bolt-Ons



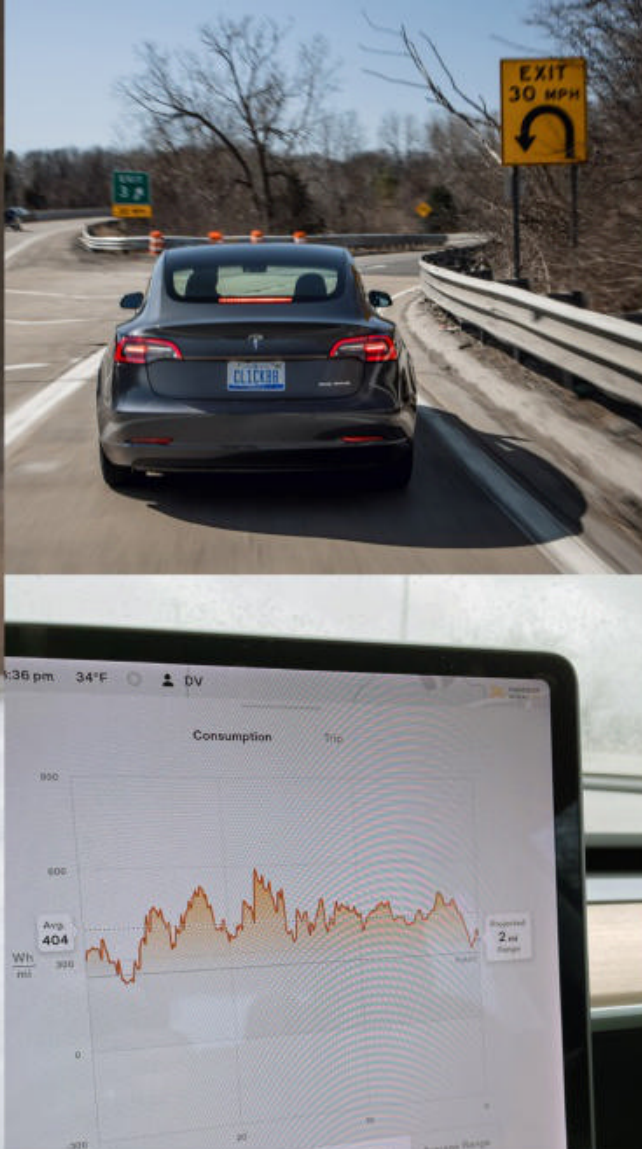
JUST ADD (FROZEN) WATER

To see how much fun our Model 3 could deliver, we took it to an ice autocross in rural central Michigan. One problem: Unlike on the Model 3 Performance, the stability control can't be disabled on lesser Model 3s, making for zero fun on slippery surfaces. Cue the aftermarket. Mountain Pass Performance, which sells all manner of go-fast bits for Teslas, developed an electronic module it calls a Partybox (\$920) to fool the Model 3 into allowing tail-out buffoonery. It's an easy install: Tap into 12-volt power under the dash and plug the Partybox into the Model 3's wiring harness.

We then went to one of our favorite winter-tire brands, Nokian, mounting a set of its brand-new Hakkapeliitta R5 EVs (the "EV" designates a foam layer to quell noise). Nokian says the R5s have grip crystals that "work like built-in studs." In the few short spots where we were pointed straight on the 1.9-mile course, it sure felt like it. The Model 3 accelerated quicker than we thought possible in the ultraslippery conditions, clawing its way to peak speeds of 60 mph. The Partybox allowed us to hang the Model 3's tail out in big, beautiful slip angles—so big, in fact, that we worried the car might keep going all the way around. But it never did, as Mountain Pass has done a masterful job of dialing in the balance. The Model 3 was no slouch: Our best time put us ahead of stalwarts such as a modified Subaru Impreza. Each of the four timed runs used about 5 percent of the battery capacity, leaving us plenty of energy to get to a Supercharger for a top-off before the two-hour drive home.



Above right: We allowed our readers to pick a vanity plate for the Model 3. We were secretly pulling for GASHAWG.



BATTERIES DEGRADE

Like a cellphone battery, the lithium-ion packs that power today's EVs lose their ability to hold energy over time. The big questions are how much and how quickly. Two things that accelerate the falloff are lots of fast-charging and charging all the way to 100 percent, both of which we did quite often. Using third-party software called TeslaFi, we could nerd out on all kinds of data about our car's driving and charging, as well as monitor its battery loss. At the 20,000-mile halfway point of our test, our car showed about a 6 percent loss, or a 19-mile range reduction. At that rate, we were on a path to invoke Tesla's warranty of a minimum of 70 percent retention of the battery capacity for eight years or 120,000 miles. But then our battery pack held steady, finishing 40,000 miles with no further capacity reduction.

CHANGE IS INEVITABLE

Tesla is famous for frequent software updates, and the rest of the industry is racing to match the ability to wirelessly roll out new features, overhaul just about any subsystem, or even boost peak power by 5 percent, another first for our long-term stable. We downloaded 38 new versions of software during our 40,000 miles, averaging an update every 20 days. Not all of them made noticeable changes, like follow-ups to fix bugs. However, some were substantial,

including the super-useful Sentry mode to monitor and record the car's surroundings when movement is detected, Smart Summon to remotely send for the car, Camp and Dog modes to keep the climate control active even when you've left the vehicle, traffic-light recognition, and, just after our 40,000 miles were complete, an entirely new screen design. Others were less worthwhile, such as the ability to annoy passersby with noises—including, of course, juicy flatulence—using the exterior speaker, which was iffy even before Tesla was later forced to recall the feature over concerns of drowning out mandated pedestrian warning sounds.



Rants and Raves

Our Model 3 has changed substantially since we got it. Autopilot stopping at stop signs and traffic lights is very impressive, although it stops at green lights too.

—CONNOR HOFFMAN

Hot air starts blowing almost instantly, which is nice on a cold morning.

—JOEY CAPPARELLA

How has the SEC not investigated Tesla for selling a future feature (Full Self-Driving) without a specified date and failing to deliver it to thousands of Tesla owners, including us?

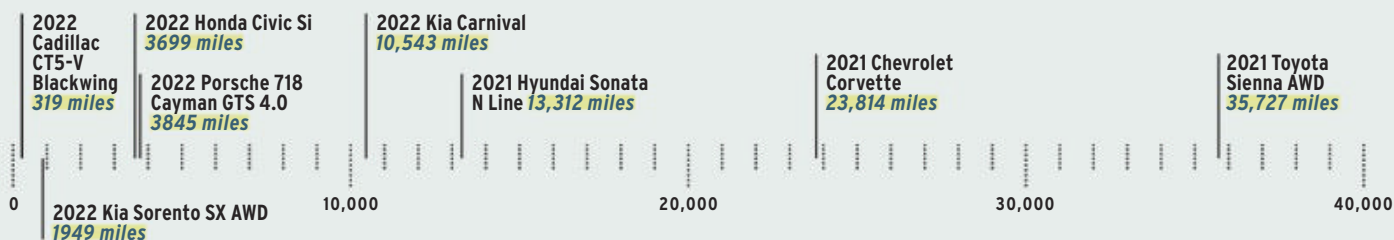
—K.C. COLWELL

It's weird that Tesla doesn't like to lend us cars, because the cars are probably the best thing about the company.

—JOEY CAPPARELLA

Fleet Files

HERE'S HOW OUR OTHER LONG-TERM VEHICLES ARE FARING IN THEIR 40,000-MILE TRIALS:



Bonding Phase

2022 RAM 1500 TRX

ARRIVAL: OCTOBER 2021

MILES: 16,362

OBSERVED MPG: 10

Electric pickups may be starting to arrive, but conventional gas-powered half-ton trucks remain the highly versatile heart of the market. In the case of the 702-hp Ram 1500 TRX and its supercharged 6.2-liter V-8, long-travel suspension, and stunning ability to hit 60 mph in 3.8 seconds, they can also be highly entertaining. Forget that the 88.0-inch-wide TRX can cause “claustrophobia in city traffic,” according to its logbook. We’re convinced (for now) that its bellowing roar and 10Best-winning pedigree are worth its day-to-day hassles. Bolstering its popularity are an 8100-pound tow rating and a 1310-pound payload capacity.

The fun factor doesn’t come cheap. The TRX starts at \$75,175, and our generously optioned version commands an even dearer \$91,030. Our maintenance bill thus far has tallied \$305 for two routine oil changes.



A search for better winter-weather traction led to the stock 35-inch Goodyear Wrangler Territory AT tires being temporarily replaced by BFGoodrich All-Terrain T/A KO2s, relieving us of \$1476. Our biggest gripe has been the buggy 12.0-inch touchscreen, which occasionally freezes up and drops smartphone connections, even after a software update. Fortunately, that has cost us only some patience, meaning we have more money to dump into the 33.0-gallon fuel tank—something our truck’s pitiful 10-mpg average has forced us to do with alarming regularity. —Mike Sutton

Introduction

2022 BMW M3

ARRIVAL: OCTOBER 2021

MILES: 6678

OBSERVED MPG: 19

We didn’t get the quickest M3 for our long-term test. The M3 Competition has 503 horsepower and available all-wheel drive, but it’s automatic only. Our long-term M3 has a mere 473 horsepower, rear-wheel drive, and a six-speed manual. So far we think it’s the right one to live with for the next year. We went bold with Isle of Man Green Metallic paint (\$550) and M Shadowline black inlay in the headlights (\$300), the better to distract from the car’s novelty-size snout. We also opted for the \$900 M Drive Professional



package, which brings a track-mode setting, 10-stage traction control (yes, 10), a feature that scores your drifts, and lap-timer functionality through a phone app. With a few more options, our M3 totals \$77,825.

The break-in process asked us not to exceed 5500 rpm or 106 mph for the first 1200 miles. Next, until the 3100-mile mark, the owner’s manual advised, “Use the maximum speed of 155 mph . . . only briefly, for instance when passing.”

Check. Within these restrictions, we found plenty to enjoy. Break-in done, the M3 reached 60 mph in 3.9 seconds and completed the quarter-mile in 12.2 seconds at 117 mph—roughly half a second slower than the rear-drive M3 Comp. The more powerful M3 may be quicker, but we’ve yet to care so far. —Carlos Lago

CAR AND DRIVER INTELLIDASH+™

ENHANCE YOUR ON-ROAD EXPERIENCE



DISCOVER THE CAR AND DRIVER INTELLIDASH+™

Intellidash+™ plug-and-play 7" IPS Touchscreen display, puts all the cutting-edge features of your smartphone conveniently on your vehicle's dashboard. Handle navigation, messages, phone calls, music and more with zero installation or complicated setup. You can even link your device's Siri® or Google Assistant™ to control Intellidash+™ using only the sound of your voice.

ACCESS YOUR SMARTPHONE'S:



GPS
NAVIGATION



CALL
CONTROLS



MESSAGES
READ OUT LOUD



MUSIC &
PODCASTS



AVAILABLE NOW AT

amazon.com

CARANDDRIVER.COM/CARACCESSORIES



MirrorLink





THE RUNDOWN

An expert look at the newest and most important vehicles this month.

Subaru is the Japanese name for the Pleiades cluster. Two new Subie stars on pages 74 and 75.

2022 ACURA NSX TYPE S ~ BY MATT FARAH

Closing Time

Highs: The joy of devouring corners, steering sharpness, 94 decibels of V-6 song. **Lows:** No quicker than before, yawn-inducing Normal mode, big-and-tall shoppers may find it tight.

Production of the second-generation Acura NSX is ending. The reason is simple: In five years, only 2548 sold globally, which must be at least mildly disappointing to the folks at Acura. The NSX is arguably one of the most underappreciated performance cars on the market—but that statement is not without a few caveats.

The NSX has struggled to find its way. To close its run, the final 350 cars built will be the new 600-hp Type S edition, which retains everything that was very good about the mid-engine hybrid sports car and adds elements that

worked from the GT3 program. Thanks to the race car's turbochargers pumping up to 16.1 psi of boost (up 0.9 over the standard car), new injectors, and 15 percent more efficient intercoolers, the double-overhead-cam V-6 benefits from a 20-hp bump and 36 more pound-feet of torque. Acura has also reprogrammed the adaptive magnetorheological dampers and electrically assisted power steering, somehow cut the nine-speed dual-clutch

auto's shift times in half, and fitted new Honda-spec Pirelli P Zero PZ4 tires, although the skidpad grip chimed in at 0.99 g, a few hundredths lower than we expected. Despite the added power, the Type S ran the same 2.9-second time to 60 as the last NSX we tested, yet it clipped a tenth to post an 11.0-second quarter-mile at 126 mph.

On the nearly two-mile Long Beach road course, Acura claims, the Type S is three seconds faster than last year's car, a large improvement on a bumpy,





FREE SHIPPING
NO MINIMUM

6 Cool Cotton Tees only \$29.99

That's \$5 each - Save \$63 today!

Regular Price
~~\$93.70~~



"I've always gotten great outdoor clothing from Atlas For Men, and the prices really can't be beat for the quality." - Peter M, NY

Today these Six Sporty Shirts are yours for just \$29.99 - a 68% saving off the regular price

Atlas For Men know a thing or two about apparel. They're one of Europe's largest home shopping brands, specializing in men's sport leisure. Now they're here in the USA doing what they do best - creating practical, sporty designs at great value prices. Always.

This set of SIX tees runs true to these values. Like all the best, these are made from high quality super-soft 100% cotton with stretch-proof ribbed collars, guaranteed to keep you cool in the summer heat.

And each one features a unique designer print exclusively created in their studios in the heart of Paris. Where better for a whole lotta French style at an unbeatable price? Talk to our friendly consultants TOLL FREE, or go online now while stocks last - when they're gone, they're gone.



100% cotton (approx. 4.7 oz/yd²)
Available sizes:
S M L XL XXL 3XL 4XL
Product Ref: 06172792

COMPLETE THE LOOK
2 Pairs of Lightweight
& Quick-Dry Shorts

88% OFF

\$5.99
~~\$50.40~~

SAVE \$44.41



100% polyester (approx. 3.2 oz/yd²)
Available sizes:
S M L XL XXL 3XL 4XL
Product Ref: 06172791

www.atlasformen.com/multipack

or call toll free: 1-833-422-3340

QUOTE
PROMO CODE:
10440

or scan
here >>



ORDER YOURS TODAY!

☐ CREDIT CARD ☐ CHECK (payable to Atlas For Men)

Complete & mail to: Atlas For Men - 38 North Main Street, PMB 256, Saint. Albans, VT 05478

Card # _____ Exp. Date ____/____/____ CVV/CVC _____

Mr. Mrs. Ms. _____

Address _____

City & State _____ Zip Code _____

Phone # _____

SATISFACTION GUARANTEED

or Full Refund of merchandise purchase price up to 100 days after receipt.

Available Sizes: S M L XL XXL 3XL 4XL

When you pay by check, you authorize us to use information from your check to clear it electronically. Funds may be withdrawn from your account as soon as the same day we receive your payment, and you will not receive your check back from your financial institution. Cash payment is not accepted.

CODE: 10440	SIZE?	QUANTITY?
Pack of SIX T-Shirts Ref: 06172792		
TWO PAIRS Shorts Ref: 06172791		
FREE SHIPPING		
Please add applicable sales tax* to total amount.		
I pay a total of \$_____.		

Stock is limited - when they're gone, they're gone.

Offers and pricing valid through August 3, 2022. Offer available in contiguous states of the US, excluding California. Delivery within 10 working days from dispatch, stock subject to availability. Prices are in U.S. dollars and exclude sales tax. Cannot be combined with another offer. *Sales Tax: please add the appropriate sales tax due on orders delivered into the following states: AR GA IA IL IN KS KY MD MI MN NC ND NE NJ NV OH OK PA RI SD TN UT VA VT WA WI WV WY. You authorize us to charge and collect applicable sales tax for your order and agree to pay said tax.

For information on how we use information we collect from you, please see our website: atlasformen.com/privacy. Products are not made in the US.

USA S22 10440 - May 2022 Atlasformen SAS, 87-89 Rue La Boétie, 75008, Paris, FRANCE. Company No. Paris B 449 149 038



Above: Red seats, even if only partial, are a hallmark of a racy Honda. Below left: A manual gearbox could have resulted in way more sales and a longer life cycle. Below right: Flat paint, flat desert.

unforgiving circuit. On public roads, the Type S gives up nothing to the old car in exchange for the extra speed. The ride is still supple, even in the most extreme Sport+ mode.

In the canyons north of Los Angeles, the Type S builds on the strengths of the second-gen NSX. It still can keep up with supercars that cost four to five times more, which, you might be old enough to remember, was pretty much what was said about the original NSX back in the early '90s.

On its new tires, and with the added power and tweaking, the Type S is absolutely banzai fast up the road. The steering is perfectly sharp, the carbon-ceramic brakes scrub speed while maintaining beautiful stability, the torque from the electric motors is instant and overwhelming, and the poise deep into the triple digits is magic. Acura manipulated the airflow around the car to optimize both engine cooling and high-speed composure. You'd need a McLaren 720S (at double the Acura's price) or a Ferrari SF90 (at triple the Acura's price or more) to gap an NSX Type S on a curvy road.

THE NUMBERS

Vehicle Type: mid-engine, front- and mid-motor, all-wheel-drive, 2-passenger, 2-door coupe

Base/As Tested \$171,495/\$192,495

Powertrain: twin-turbocharged and intercooled DOHC 24-valve 3.5-liter V-6, 520 hp, 443 lb-ft; 2 AC front motors, 36 hp and 54 lb-ft each; AC rear motor, 47 hp and 109 lb-ft (combined output: 600 hp, 492 lb-ft)

Transmissions, F/R: direct-drive/9-speed dual-clutch automatic

Dimensions

- **Wheelbase** 103.5 in
- **L/W/H** 178.5/76.3/47.8 in
- **Curb Weight** 3898 lb

TEST RESULTS

60 mph 2.9 sec

100 mph 6.7 sec

1/4-Mile 11.0 sec @ 126 mph

130 mph 11.8 sec

150 mph 17.3 sec

Results above omit 1-ft rollout of 0.2 sec.

Rolling Start, 5-60 mph 3.6 sec

Top Speed (mfr's claim) 191 mph

Braking, 70-0 mph 155 ft

Braking, 100-0 mph 304 ft

Roadholding, 300-ft Skidpad 0.99 g

EPA Fuel Economy

• **Comb/City/Hwy** 21/21/22 mpg

Dynamically, there's very little to criticize here when bending the Type S into and out of corners. The hybrid system remains a mostly invisible hand filling in torque where it would otherwise dip—that is, until max thrust is requested. The Type S handles like it's at least 300 pounds lighter than its 3898-pound curb weight would suggest. And despite that there aren't any whiz-bang features and the infotain-





ment touchscreen is out of an old Honda Civic, the materials and fit are commensurate with the \$171,495 base price.

Now, for those caveats. While the Type S cabin is attractive, larger drivers will find the cockpit a bit too small for daily use or long road trips. The roof intrudes on the driver above the door glass, and so while headroom is adequate, seeing out is difficult. A Porsche 911 is a London Taxi by comparison.

The hybrid system, though seamlessly integrated, makes the NSX act like a Toyota Prius around town in Normal mode as it switches from slowpoke electric-only to the gas engine. This may be fine for the NSX customer who wants to save fuel or has cranky neighbors who like to sleep in. But even in Sport+ mode, at legal(ish) and reasonable speeds, the Type S plants itself on the refined and demure side of the supercar spectrum. In contrast, a Porsche 911 GT3 reminds you of its specialness 100 percent of the time, both on track and when slogging along on a Los Angeles freeway.

The Type S attempts to pull off a split personality. In Normal mode, it downplays the whole supercar shtick, moving about quietly and without much verve. But because it's low and somewhat cramped, there's no forgetting you're in a mid-engine two-seater with a fighter-plane body, regardless of how silently it operates. The solution is to always lean into it. Fortunately, flicking the big silver knob on the dash over to Sport+ and selecting the gearbox's manual mode the very second you start the car will keep the engine on and the throttle sharp, with 94 decibels of screaming V-6 going right to your ears at wide-open throttle. That's better.

Speak to NSX owners, first and second generation alike, and you'll find a passionate group in love with their cars. In many ways, the NSX still punches above its weight class. But when you're knocking on the door of 200 large, there are more choices than ever—911 Turbo S, Audi R8, McLaren GT—and the NSX didn't connect with most enthusiasts. Nevertheless, if you've ever considered an NSX for even a second, the Type S is not only your last chance but your best chance to get one of the greatest Japanese sports cars ever sold to the public.

Acura assembles the NSX at the Performance Manufacturing Center in Marysville, Ohio; the 520-hp twin-turbo 3.5-liter V-6 is built in nearby Anna, Ohio.



Turning Over

More than a decade after the original Leaf, Nissan rolls out its second EV.



Nissan took an early lead in mainstream EVs, selling nearly 600,000 Leafs since 2010. For most of that time, the Leaf was the world’s most successful EV. Yet the speed with which Tesla’s Model 3 usurped the title illustrated the market shift toward faster, more expensive, and more exciting EVs. The new Nissan Ariya is considerably better attuned than the humble Leaf to that changed dynamic.

Riding on a platform that was co-developed with Mitsubishi and Renault, Ariyas use current-excited synchronous AC motors, just like the new BMW i4 and iX. The front-wheel-drive Ariya has a single 238-hp motor, while the all-wheel-drive dual-motor version offers 389 horsepower and varies each motor’s output and regen to reduce dive and squat motions. The front-drive Ariya, with the smaller 63.0-kWh battery pack, should have an EPA range of at least 210 miles, while the 87.0-kWh pack is targeting 300 miles. All setups support 130-kW DC fast-charging via a CCS connector, not the less popular CHAdeMO plug the Leaf still uses.

The Ariya is fractionally shorter than the Toyota RAV4, yet it looks bigger. The bluff front end has an expansive not-grille, and the cab-forward packaging puts the base of the windshield over the front-axle line. This design certainly has more presence than the Leaf.

The falling roofline doesn’t grievously compromise interior volume or adult-viable rear-seat accommodations. The well-finished cabin feels elegantly minimalist, with conjoined 12.3-inch display screens for instrumentation and

THE NUMBERS

Vehicle Type: front- or front-and-rear-motor, front- or all-wheel-drive, 5-passenger, 4-door wagon
Base \$47,125-\$60,125
Motors: 1 or 2 current-excited synchronous AC
Combined Power 238 or 389 hp
Combined Torque 221 or 442 lb-ft
Battery Pack: liquid-cooled lithium-ion, 63.0 or 87.0 kWh
Transmission: direct-drive
Dimensions
• **Wheelbase** 109.3 in
• **L/W/H** 182.9/74.8/65.4-65.7 in
• **Curb Weight** 4200-4700 lb
Performance (C/D est)
• **60 mph** 4.9-7.2 sec
• **1/4-Mile** 13.0-15.8 sec
• **Top Speed** 115 mph
EPA Fuel Economy (C/D est)
• **Comb/City/Hwy** 93-105/99-110/90-99 MPGe
• **Range** 210-300 mi

According to Nissan, the interior looks like “a sleek café lounge on a starship.” Take that, Tesla.

infotainment. Physical switchgear is limited to audio and cruise-control buttons on the steering wheel. Integrated with the dashboard’s simulated wood trim are some capacitive buttons with haptic feedback for the climate control. Similar controls for the accelerator-pedal function and drive modes are on the center console, along with a switch that opens and closes a motorized underdash storage compartment.

Our drive on Spain’s Circuito del Jarama in the single-motor version confirmed that a racetrack is hardly the ideal environment for a heavy front-drive EV. Acceleration is solid rather than scintillating. Expect a 7.2-second 60-mph dash from the front-driver and a sub-five-second time from the all-wheel-drive version. The suspension is far too soft for track work, but this pliancy will likely deliver decent ride quality in the real world. Nissan says there are no plans to offer adaptive dampers, and Sport mode merely increases the accelerator’s sensitivity.

Yet other details did impress. The Ariya deftly blends its regenerative and friction braking, and although it doesn’t provide true one-pedal operation—stopping requires brake-pedal pressure—it felt better calibrated than many rivals. The steering offers good weight and linear, accurate responses.

This first impression in an admittedly unlikely environment nonetheless left us thinking the Ariya should play well in an EV market that’s much different from when the Leaf wore its crown.



Boost Testosterone

Drive & Peak Performance



EXPIRES 08/31/22 MANUFACTURERS COUPON

SAVE \$3.00
ANY IRWIN NATURALS PRODUCT

Consumer: Redeemable at retail locations only. Not valid for online or mail-order purchases. Retailer: Irwin Naturals will reimburse you for the face value plus 8 (cents) handling provided it is redeemed by a consumer at the time of purchase on the brand specified. Coupons not properly redeemed will be void and held. Reproduction by any party by any means is expressly prohibited. Any other use constitutes fraud. Irwin Naturals reserves the right to deny reimbursement (due to misredemption activity) and/or request proof of purchase for coupon(s) submitted. Mail to: CMS Dept. 10363, Irwin Naturals, 801 Union Pacific Blvd Ste 5, Laredo, TX 78045-9475. Cash value: .001 (cents). Void where taxed or restricted. ONE COUPON PER PURCHASE. Not valid for mail order/websites. Retail only.

0710363-014899

These statements have not been evaluated by the Food & Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

\$3 COUPON redeemable at all Drug, Grocery and Health Food stores Nationwide



**ROAD & TRACK QUARTER
ZIP SWEATSHIRT**



**LIVE THE DRIVE
BASEBALL CAP**

**ROAD &
TRACK**

SHOP

**NOW
FEATURING
CAR AND DRIVER
GEAR!**



**LIVE THE DRIVE
LONG-SLEEVE T-SHIRT**



**CAR AND
DRIVER
SAVE THE
MANUALS
T-SHIRT
AND MAGNET**

VISIT SHOP.ROADANDTRACK.COM



THE NUMBERS

Vehicle Type: front-engine, all-wheel-drive, 7-passenger, 4-door wagon

Base **\$67,745**

Engine: turbocharged and intercooled DOHC 24-valve V-6, aluminum block and heads, direct fuel injection

Displacement 183 in³, 2997 cm³

Power 355 hp @ 5500 rpm

Torque 354 lb-ft @ 1400 rpm

Transmission: 10-speed automatic

Dimensions

• **Wheelbase** 113.8 in

• **L/W/H** 198.4/78.7/67.1 in

• **Curb Weight** 4750 lb

Performance (C/D est)

• **60 mph** 5.6 sec

• **1/4-Mile** 14.3 sec

• **Top Speed** 130 mph

EPA Fuel Economy

• **Comb/City/Hwy** 19/17/21 mpg

2022 ACURA MDX TYPE S ~ BY JOEY CAPPARELLA

Great Aspirations

The Acura MDX Type S's turbocharged 355-hp V-6 makes it a contender in the luxury-crossover segment.

The **Type S** version of the Acura MDX appears to be a high-performance model in the vein of the SUVs that wear Mercedes-AMG, BMW M, and Audi RS badges. But we think the real play here is simpler than that: Acura wants to move the MDX out of the near-luxury realm and onto a more prestigious plane alongside the Germans and Genesis.

The regular MDX, with its 290-hp 3.5-liter V-6, will continue to constitute the bulk of the model's sales, thanks to its attractive base price of \$49,045. But now the introduction of the 355-hp Type S version allows Acura to play at the higher price points where the fatter profit margins and more discerning customers are. The MDX Type S thus comes armed with a more powerful engine, a sophisticated suspension setup, and lots of features.

For \$67,745, you get the turbocharged 3.0-liter V-6 from the TLX Type S. With those 355 horses and 354 pound-feet of torque, it has more grunt than the 335-hp Audi Q7 55 and BMW X5 40i but is a bit behind the 375-hp Genesis GV80 3.5T. Acura's torque-vectoring Super Handling All-Wheel Drive system is standard, as are adaptive dampers and air springs that can raise and lower the MDX.

The \$5350 Advance package brings massaging front seats, richer upholstery, and a bumpin' 25-speaker ELS audio system. This is the kind of stuff Audi and BMW customers expect in a luxury SUV. The open-pore wood and quilted leather are convincingly upscale. The only sore spot is Acura's infotainment touchpad, which we still haven't warmed up to.

We anticipated more of a performance focus from something with a

Type S badge, however. The turbocharged V-6 is strong enough to move the MDX confidently but is not as characterful or responsive as we'd like. Acura expects the Type S to be almost a second quicker to 60 mph than the standard model, which gets there in 6.4 seconds. The MDX was already nimble for a three-row SUV, and the suspension revisions tighten body control. But the all-season tires limit grip, and the steering feels overboosted and artificial.

Maybe we're placing too much importance on the last part of the name. The Acura MDX Type S has an appropriate mix of refinement and driving verve when measured against the BMW, Audi, and Genesis SUVs it's aiming for. And if luxury-SUV customers can be persuaded to shell out more than \$70,000 for a loaded Acura, they'll find that the MDX Type S has the features, the power, and the luxury quotient to live up to that price.

RIDING ON AIR

The MDX Type S is the first Acura to feature air springs. In Sport and Sport+ modes, it drops down 0.6 inch, while selecting Lift mode hikes the body a full 2.1 inches above its standard ride height.





CUPCOFFEE



CARGO LINER



CUPFONE®

**ELEVATE
YOUR RIDE**

Give your vehicle fresh new features this season: WeatherTech products. Choose Cargo Liner for a laser-measured fit that shields your entire trunk, CupCoffee for taking oversized mugs on the go, and CupFone to navigate hands-free to any destination. Find the right products for your vehicle today at [weathertech.com](https://www.weathertech.com).



© 2022 MacNeil IP LLC

WeatherTech®.com
Auto. Home. Pet. Find Your Fit. 1-800-441-6287



2022 BMW iX xDRIVE50 ~ BY ELANA SCHERR

Sartorial Utility Vehicle

Highs: Red-carpet-level glamour inside, smooth and silent ride, pin-you-to-the-seat acceleration. **Lows:** All that grille with nowhere to go, funky-shaped steering wheel.

Dressed to the nines—some might say overdressed, with those massive patterned grille panels—the BMW iX xDrive50 is a Broadway diva on opening night. It's theatrical and unapologetic, and it would be excessive if it weren't also balanced, powerful, and as smooth as the raising of a velvet curtain.

Expectations for any new high-end EV are that it's quick and can go more than 300 miles on a charge. At \$104,820 as tested, the iX is certainly high-end and hits its marks on performance and range. Two current-excited AC motors combine for 516 horsepower. Accompanied by a hum, they scoot the 5682-pounder to 60 mph in 4.0 seconds. A 105.2-kWh battery pack provides 315 miles of EPA range. Skip the 22-inch wheels and you'll add nine miles with the 20s, but the 22s are lookers, and with the air springs (\$1600), the ride quality remains calm. (Oddly, the 21-inch wheels drop range to 305.)

Using a DC fast-charger, the iX can add 90 miles of range in 10 minutes, BMW says, or go from almost empty to an 80 percent charge in under an hour. We put on a lot of miles, which meant plenty of time spent at charging stations, where our only complaint was the single charge port's placement over the rear wheel, which rarely matched up well to the charging-station layouts.

Regenerative braking can be tailored to provide one-pedal driving. With the help of GPS data and sensors, Adaptive mode adjusts the regen to be more aggressive in urban traffic and less so on open roads, where it allows coasting. Use the actual brakes and the iX stops from 70 mph in 166 feet, besting rival electrics. It is less dominant on the skidpad, where it managed only 0.84 g. In street driving, though, the iX is much more maneuverable than its size would suggest, thanks in large part to rear-wheel steering, and it untangles twisty roads like a yarn-ball winder. That it is so capable in corners and yet so plush and silent over all kinds of road surfaces feels like a magic trick.



The iX interior earns a standing ovation. BMW rejects the sparse minimalism of so many EV interiors, but it doesn't look overdone or cluttered. A floating curved panel houses digital gauges and a touchscreen that are just large enough to feel modern without turning the cabin into a video-game designer's cubicle. Disappointingly, there's no front trunk. But the rear cargo area, at 36 cubic feet with the seats up (that's more than the X5), is large enough for most luggage and shopping needs. If we had to take one thing off, we'd swap the hexagonal steering wheel for a round one. But that's a small critique considering this outlandish production. Both in driving satisfaction and comfort, the iX is a showstopper.

THE NUMBERS

Vehicle Type: front- and rear-motor, all-wheel-drive, 5-passenger, 4-door wagon

Base/As Tested \$84,195/\$104,820

Motors: 2 current-excited synchronous AC, 268 and 335 hp, 260 and 295 lb-ft

Combined Power 516 hp

Combined Torque 564 lb-ft

Battery Pack: liquid-cooled lithium-ion, 105.2 kWh

Transmissions: direct-drives

Dimensions

• **Wheelbase** 118.1 in

• **L/W/H** 195.0/77.4/66.8 in

• **Curb Weight** 5682 lb

TEST RESULTS

60 mph 4.0 sec

100 mph 9.3 sec

1/4-Mile 12.3 sec @ 115 mph

Results above omit 1-ft rollout of 0.3 sec.

Rolling Start, 5-60 mph 4.3 sec

Top Speed (gov ltd) 123 mph

Braking, 70-0 mph 166 ft

Braking, 100-0 mph 344 ft

Roadholding, 300-ft Skidpad 0.84 g

EPA Fuel Economy

• **Comb/City/Hwy** 86/86/85 MPGe

• **Range** 315 mi

TĒGO Automotive Products Inc.

License Plate Retractor

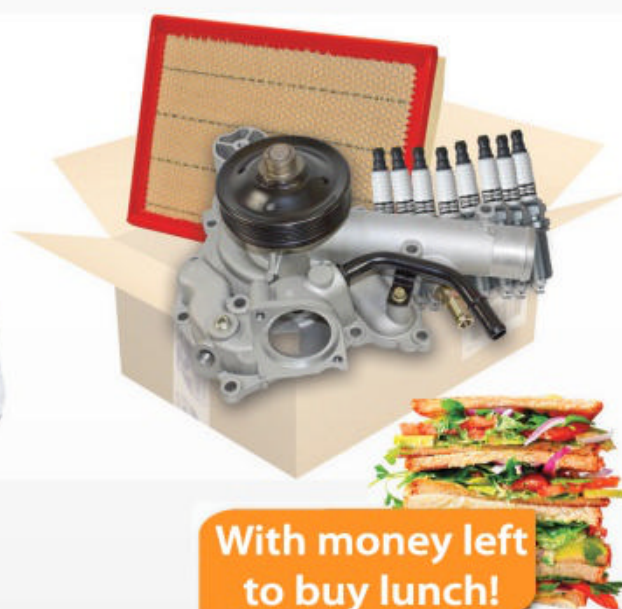


www.TEGOAUTOProducts.com
805-435-9876



Check State and Local laws about use in your area.

BUY NOW



**With money left
to buy lunch!**

Get this with your
money at a typical
auto parts store.

Or ALL this at
www.RockAuto.com!



- ✓ Reliably Low Prices
- ✓ Easy To Use Website
- ✓ Huge Selection
- ✓ Fast Shipping

SHOP NOW



DRIVEN BY PERFORMANCE

We strive to continuously deliver a perfect-match color system, starting with the highest performing paint in the industry. Formulated for deep color, outstanding luster, and incredible durability, we offer more than 300,000 precision matched OEM colors for practically any car. The pro-like performance goes on with your choice of easy to use aerosol, paint pen or brush-in-bottle applicators.

Automotivetouchup.com
888-710-5192

EV Meets ORV

With the new Solterra, Subaru brings some off-road cred to the mainstream-EV segment.

The **Subaru Solterra** doesn't have 500 horsepower or 300 miles of range. It can't recharge in 15 minutes or power your house. Nor will its design bowl you over. We'd consider it a homework assignment turned in late were it not for its off-road acumen, an unusual attribute among mainstream EVs. It's only a matter of time before we see a Solterra with a two-inch lift and a set of BFGoodrich KO2s.

Like the BRZ coupe, this Subaru was jointly developed with Toyota. Its counterpart is the bZ4X, a name that just rolls off the tongue. But these EVs diverge more than the BRZ/GR86 twins, mostly because all Solterras are all-wheel drive, while the bZ4X has a front-drive variant. With 8.3 inches of ground clearance, decent approach and departure angles, and 19.7 inches of water-fording ability, the Solterra should easily get your mountain bikes to the trailhead. It proved surprisingly capable on some Arizona ORV trails, scrambling up inclines steep enough that we had to use the forward-looking camera to see over blind crests.

The Solterra has Subaru's dual-function X-Mode system, which tailors power delivery to the terrain, allowing some wheelspin in



The Solterra name is a mash-up of the Latin words for sun and earth. The spacious interior measures 96 cubic feet, and there's 30 cubic feet of cargo space under the hatch.

sand, for instance. The Solterra uses its brakes to mimic a limited-slip differential, so even with two corners of the car in the air, you can still generate forward progress.

The two motors combined produce 215 horsepower and 249 pound-feet of torque, good for a claimed 6.5-second 60-mph time. This vehicle clearly belongs to the Outback-and-Crosstrek side of the Subaru family tree rather than the WRX branch, but the Solterra can route 60 percent of its torque rearward for a more playful feel. In the interest of science, we confirmed that it's happy to rip a donut.

The battery offers 222 to 228 miles of EPA range depending on trim. Charging isn't superquick: A Level 2 connection replenishes the battery in nine hours, and a 100-kW DC fast-charger delivers an 80 percent charge in 56 minutes, according to Subaru. If your campsite is more than 100 miles away, bring a generator or take the Forester.

Unfortunately the Solterra (and bZ4X) design doesn't prioritize cargo-hauling practicality. There's no frunk, and the raked roofline makes the cargo hold better suited for groceries than, say, bikes. But the roof rack's 700-pound static



THE NUMBERS

Vehicle Type: front- and mid-motor, all-wheel-drive, 5-passenger, 4-door wagon
Base (C/D est) \$40,000
Motors: 2 permanent-magnet synchronous AC, 107 hp, 125 lb-ft
Combined Power 215 hp
Combined Torque 249 lb-ft
Battery Pack: liquid-cooled lithium-ion, 66.0 kWh (C/D est)
Transmissions: direct-drives
Dimensions
• **Wheelbase** 112.2 in
• **L/W/H** 184.6/73.2/65.1 in
• **Curb Weight** 4400 lb
Performance (C/D est)
• **60 mph** 6.5 sec
• **1/4-Mile** 15.2 sec
• **Top Speed** 110 mph
EPA Fuel Economy
• **Comb/City/Hwy** 102-104/111-114/93-94 MPGe
• **Range** 222-228 mi

capacity is stout enough for tents, and a rear “activity mount” can accept bike racks and cargo carriers. The tow rating, however, is “don’t.”

Subaru shouldn’t have any problem selling this year’s 6500-unit production, but whether it can increase volume will depend on pricing—as yet unannounced. At \$40,000 or so, and eligible for a \$7500 tax credit, the Solterra makes sense. Priced much higher, it would face competitors with considerably more power and range, attributes that for most EV buyers are more important than off-road ability.



2022 SUBARU WRX LIMITED ~ BY K.C. COLWELL

LAST SHOT AT LOVE?

There is a refreshing honesty to the new WRX. It continues to be a clear descendant of the bug-eyed example enthusiasts fell in love with 20 years ago. Subaru has remained true to the original formula, giving the new one a turbocharged flat-four, all-wheel drive, a standard manual transmission, and bear-hugging front seats. The engine still warbles when the weather is cold, and the suspension, though slightly softer than before, occasionally punishes. It’s a hot-rod economy car. It doesn’t even have adjustable drive modes. Don’t like the way Subaru set it up? Modify it yourself, or don’t buy it. How refreshing indeed.

Base models start at \$30,100, and the Limited trim we tested goes for \$36,990. The powertrains are identical, so expect any manual WRX to hit 60 in 5.5 seconds and run the quarter-mile in 13.9 seconds at 101 mph. Skidpad cling came in at 0.95 g.

Wait, wasn’t the old WRX quicker? Blame the gearing of the six-speed manual and the 6100-rpm redline (600 lower than before) of the new 271-hp 2.4-liter flat-four. Hitting 60 in second is no longer possible, so the new WRX requires an additional shift before reaching that speed. Despite the bump from 2.0 liters to 2.4, the turbo still hits a little late and with an abruptness that middle-aged drivers might not appreciate. Younger folks, however, might like it.

Subaru has informed us that there won’t be a new STI sharing this platform due to consumers’ interest (and thus resources) shifting toward EVs. That’s too bad, because this WRX steers, stops, handles, and can be chucked sideways as well as any of its predecessors. It seems like an ideal recipient for a 40- or 50-hp injection. We’re hoping this WRX isn’t the last affordable proto-rally car. And we’d bet that a battery-powered WRX will have drive modes.

THE NUMBERS

Powertrain: 271-hp turbocharged 2.4-liter flat-4, 6-speed manual
Base/As Tested \$36,990/\$36,990
Curb Weight 3401 lb
Performance
• **60 mph** 5.5 sec
• **1/4-Mile** 13.9 sec
• **Roadholding, 300-ft Skidpad** ... 0.95 g
• **Braking, 70-0 mph** 153 ft
EPA Fuel Economy
• **Comb/City/Hwy** 22/19/26 mpg



2022 BUICK ENCLAVE AVENIR AWD ~ BY DAVID BEARD

Dear Buick

Highs: Spacious cabin, supple ride, highway serenity.
Lows: Mistakes blandness for luxury, high price of Avenir trim.

The three-row-SUV segment is cutthroat. Since the second-gen Buick Enclave debuted in 2018, nearly all the competition has been overhauled. A new crop of standout players has joined the fray, and now to be a winner in this segment, you need to be great. For 2022, Buick is trying to keep up by freshening its flagship.

Immediately noticeable are the Enclave’s new nose and tail. Squinty new headlights flank a more aggressive and attractive fascia with a larger grille, and a similar treatment is applied to the rear. The modest facelift doesn’t do much to dress up the derivative side profile, however.

The interior switchgear is refreshingly simple, with a no-nonsense button layout for the audio system and climate controls that will make flip-phone owners feel at home. Those who’ve migrated to the modern smartphone will be delighted to know they can wirelessly charge and use Apple CarPlay and Android Auto. Button lovers will appreciate the new push-button transmission controls, which are much like the Chevrolet Corvette’s. An L in place of the Vette’s M allows use of tiny shift tabs that share crowded space with volume and tuning buttons on the back of the redesigned steering wheel.

It’s unlikely that any Enclave owner will use the off-road gauges in the instrument panel’s 8.0-inch screen. Only slightly less likely is that the accelerator pedal will find the floor, in which case GM’s venerable 310-hp 3.6-liter V-6 is at the ready, with 60 mph arriving in 6.5 seconds and the quarter-mile in 15.0 seconds at 94 mph—numbers that best the Kia Telluride’s.

Buick ditched the option of a torque-vectoring rear differential last year, but we didn’t detect a difference on the road or during instrumented testing. The handling remains secure, if relaxed. The optional adaptive dampers smooth out rough roads with only the occasional thump from Michigan’s almost-sinkholes reverberating through the chassis.

The new push-button shifter doesn’t open up more space inside. Simple and clear controls make life refreshingly easy.



THE NUMBERS

Vehicle Type: front-engine, front/all-wheel-drive, 7-passenger, 4-door wagon
Base/As Tested \$58,295/\$60,450
Engine: DOHC 24-valve V-6, aluminum block and heads, direct fuel injection
Displacement 223 in³, 3649 cm³
Power 310 hp @ 6800 rpm
Torque 266 lb-ft @ 2800 rpm
Transmission: 9-speed automatic
Dimensions
• **Wheelbase** 120.9 in
• **L/W/H** 204.8/78.8/69.9 in
• **Curb Weight** 4687 lb

TEST RESULTS

60 mph 6.5 sec
1/4-Mile 15.0 sec @ 94 mph
100 mph 17.2 sec
120 mph 31.3 sec
Results above omit 1-ft rollout of 0.3 sec.
Rolling Start, 5-60 mph 6.8 sec
Top Speed (C/D est) 130 mph
Braking, 70-0 mph 176 ft
Roadholding, 300-ft Skidpad 0.83 g
C/D Fuel Economy
• **Observed** 16 mpg
• **75-mph Hwy Driving** 23 mpg
• **Hwy Range** 490 mi
EPA Fuel Economy
• **Comb/City/Hwy** 20/17/25 mpg

On the interstate, the Enclave’s spacious cabin is hushed, and the Avenir trim’s massaging quilted-leather seats are comfortable for the duration of a tank of gas. In our 75-mph highway fuel-economy test the all-wheel-drive Enclave returned 23 mpg, short of the EPA’s 25-mpg estimate.

The Enclave starts at \$43,995. Packed with safety and luxury features, our top-dog Avenir asks \$60,450. Meanwhile, \$50K gets you a fully loaded 10Best-winning Telluride. Can’t find a Telluride for sale? A 375-hp Genesis GV80 is just a bit more than the Buick at \$61,695. See what we mean about cutthroat?

To some, sunglasses are a fashion accessory...

But When Driving, These Sunglasses May Save Your Life!

Drivers' Alert: Driving can expose you to more dangerous glare than any sunny day at the beach can... do you know how to protect yourself?

Sometimes it does take a rocket scientist. A NASA rocket scientist. Some ordinary sunglasses can obscure your vision by exposing your eyes to harmful UV rays, blue light, and reflective glare. They can also darken useful vision-enhancing light. But now, independent research conducted by scientists from NASA's Jet Propulsion Laboratory has brought forth ground-breaking technology to help protect human eyesight from the harmful effects of solar radiation light. This superior lens technology was first discovered when NASA scientists looked to nature for a means to superior eye protection—specifically, by studying the eyes of eagles, known for their extreme visual acuity. This discovery resulted in what is now known as Eagle Eyes®.

The Only Sunglass Technology Certified by the Space Foundation for UV and Blue-Light Eye Protection.

Eagle Eyes® features the most advanced eye protection technology ever created.



The TriLenium® Lens Technology offers triple-filter polarization to block 99.9% UVA and UVB—plus the added benefit of blue-light eye protection. Eagle Eyes® is the only optic technology that has earned official recognition from the Space Certification Program for this remarkable technology. Now, that's proven science-based protection.

The finest optics: And buy one, get one FREE! We are so excited for you to try the Eagle Eyes® breakthrough technology that we will give you a **second pair of Eagle Eyes® Navigator™ Sunglasses FREE** — a \$59.95 value!

Your satisfaction is 100% guaranteed. If you are not astounded with the Eagle Eyes® technology, enjoying clearer, sharper and more glare-free vision, simply return one pair within 30 days for a full refund of the purchase price. The other pair is yours to keep. Don't



Navigator™
Black Stainless
Steel Sunglasses

Receive the Navigator™ Gold Sunglasses (a \$59.95 value) FREE!
just for trying the Navigator™ Black



Navigator™ Gold Stainless
Steel Sunglasses

Fit-ons available for
\$39 + S&H
Black or
Tortoise-Shell design



leave your eyes in the hands of fashion designers, entrust them to the best scientific minds on earth. Wear your Eagle Eyes® Navigators with absolute confidence, knowing your eyes are protected with technology that was born in space for the human race.

Two Pairs of Eagle Eyes® Navigator™ Sunglasses \$119.90†
Offer Code Price \$49 + S&P
Offer includes one pair each Navigator™ Black and Navigator™ Gold Sunglasses

1-800-333-2045

Your Insider Offer Code:
EEN898-06

You must use this offer code to get our special price.

Stauer®

14101 Southcross Drive W., Ste 155,
Dept. EEN898-06
Burnsville, Minnesota 55337
www.stauer.com

† Special price only for customers using the offer code versus the price on Stauer.com without your offer code.



Rating of A+

DRAMATIC CHIP REPAIRS ARE THIS EASY!

BEFORE	AFTER
--------	-------



1. Apply 2. Level 3. Blend

'THE CURE FOR ROAD RASH™'

ORDER YOUR KIT TODAY!
RECEIVE 10% OFF
USE CODE C&D10 AT CHECKOUT
Rated #1 by The Wall Street Journal
DR. COLORCHIP™
AUTOMOTIVE PAINT CHIP REPAIR SYSTEMS
DRCOLORCHIP.COM • 866.372.2548

Explore More Sea Eagle® Explorer 380x

12'6" Inflatable Kayak for 1 - 3 People

- ✓ Light - Weighs 40 lbs.
- ✓ Easy to inflate
- ✓ Easy to Paddle
- ✓ Easy to Carry
- ✓ Easy to Check as Luggage



- ✓ Paddle Class IV rapids or flat water
- ✓ 16 open/close floor drains
- ✓ Can take an electric trolling motor (optional motor mount required)
- ✓ Multiple air compartments for maximum safety

SEA EAGLE.com

For more info

1-800-944-7496
for a FREE catalog
Dept. CA052B

The Big Glide

Updates to Lincoln's flagship SUV allow the Navigator to navigate itself.

The buzz around enormous luxury SUVs has reached fever pitch. To fend off new and enhanced entries from Jeep and Lexus, Lincoln has polished the Navigator by upgrading interior tech and adding hands-free driving capability.

Outside, thinner LED headlights flank the gently redrawn grille, while the slimmer full-width LED taillight bar now emits animation sequences when you approach or exit the vehicle. Michael Knight's K.I.T.T. would approve.

The vast, welcoming interior sees bigger changes. A new 13.2-inch touchscreen is crisply rendered and smartly laid out, running Sync 4's bounty of features—among them a window-rattling 28-speaker Revel audio system. New animations in the digital instrument cluster include swaths of twinkling stars that follow the speedo and tach needles. The second row gains an optional 5.8-inch infotainment touchscreen and dual 10.1-inch monitors, and the available captain's chairs add a massage function.

More significantly, ActiveGlide debuts as Lincoln's version of Ford's BlueCruise. It combines lane centering, adaptive cruise control, and driver monitoring to provide hands-free motoring on 130,000 miles of divided highways. In our brief exposure, ActiveGlide worked as advertised, and the driver-focused camera and infrared light emitters saw through our attempts to trick them by wearing a mask, sunglasses, and



a hat. If the system detects your attention has strayed, it beeps with increasing intensity, the steering wheel vibrates, and it eventually taps the brakes, shutting the system off. It will not stop the vehicle if you fail to heed its warnings, as some do. Ford admits to programming this initial version conservatively; improved capability will come via over-the-air updates. That's good, as ActiveGlide is currently less polished than GM's Super Cruise. We observed some wandering between lane lines, the system is quick to disengage on tighter bends, and it occasionally refused to recognize our attentiveness, even after we wiggled the steering wheel. But as a tool for reducing the strain of gridlock and boring highway treks, it's a welcome addition.

Fortunately, the Navigator is also better to drive when a human is in full control. A new camera-based system scans the road ahead and primes the adaptive dampers for upcoming bumps. A retuned suspension includes a stiffer rear anti-roll bar, and body motions are calmer and more collected. A new electronic brake booster provides a firm and progressive brake pedal, making smooth stops a cinch.

The twin-turbo 3.5-liter V-6, backed by an unhurried 10-speed automatic, again has 510 pound-feet of torque. Horsepower drops by 10 to 440, but we don't expect much deviation from the 2021 model's satisfyingly quick 5.2-second 60-mph run. EPA combined estimates inch up 1 mpg to 18 or 19 mpg, depending on the model, and the V-6's exhaust thrums more deeply, lending this big SUV a throaty voice that could almost be a V-8's. Lincoln, though, appears uninterested in a riposte to the supercharged Cadillac Escalade V. Despite that omission, the Gator's latest revisions help it keep up in the glitzy segment it pioneered. 🇺🇸

THE NUMBERS

Vehicle Type: front-engine, rear- or all-wheel-drive, 7- or 8-passenger, 4-door wagon

Base \$78,405-\$91,770

Engine: twin-turbocharged and inter-cooled DOHC 24-valve V-6, aluminum block and heads, port and direct fuel injection

Displacement 213 in³, 3492 cm³

Power 440 hp @ 5850 rpm

Torque 510 lb-ft @ 3000 rpm

Transmission: 10-speed automatic

Dimensions

• **Wheelbase** 122.5-131.6 in

• **L/W/H** 210.0-221.9/79.9/76.1-76.4 in

• **Curb Weight** 5700-6100 lb

Performance (C/D est)

• **60 mph** 5.2-5.4 sec

• **100 mph** 13.8-14.2 sec

• **1/4-Mile** 13.8-14.0 sec

• **Top Speed** 115 mph

EPA Fuel Economy

• **Comb/City/Hwy** 18-19/16-17/22-23 mpg





ONE-TIME, LIFETIME LAWN SOLUTION

SAVE 50%
AND GET FREE SHIPPING

PLANT IN YOUR EXISTING LAWN.

SPECIAL PACKAGE is ideal for planting areas up to 600 sq. feet.

150 ready-to-plant 3x3 inch **SUPER PLUGS** for just \$135 including shipping.

GUARANTEED TO GROW or We'll Replace Grass FREE!

LIMITED MAY/JUNE OFFER! ORDER TODAY
USE CODE 7102

www.BestZoysia.com
410-756-2311
Zoysia Farm
NURSERIES

© 2022 Zoysia Farm Nurseries
3617 Old Taneytown Rd, Taneytown, MD 21787

RAGGTOPP™ CONVERTIBLE CARE PRODUCTS



SOFTTOPP™ JEEP CARE PRODUCTS



USE CODE: CANDD FOR \$10 OFF YOUR ORDER OF \$50 AT WOLFSTEINS.COM

MANUFACTURER APPROVED CLEANER & PROTECTANT SYSTEMS FOR FABRIC & VINYL TOPS

TESTED AND ENDORSED BY
HAARTZ
The Original Equipment Manufacturer of Convertible & Jeep Topping

(800) 377-4700
www.WOLFSTEINS.com

TouchUp[®]RX

AUTOMOTIVE PAINT CHIP REPAIR KITS

EXCEPTIONAL PAINT CHIP REPAIRS MADE EASY

BLOB FREE. GUARANTEED.



Before After

Our 2-Step Process is Foolproof!

Remember me?
BILL McLEAN

Get My New Mac-Daddy Kit For Less Than \$50

Follow Us! 

- Better Product
- Lower Price
- Better Shine
- OEM Color Match

Made in the USA

Tackles the Worst Road Rash
Improving the Paint Chip Repair Experience for Over 400,000 Enthusiasts Since 2003

TouchUpRX.com (561) 899-3149

Get Stylish Protection for Your Garage Floor

Order now and save **20%**
Code CD20
Expires May 20, 2022

RoughTex®
Diamond Deck® Roll-Out Flooring
Comes in 23 Sizes



Pewter Black Charcoal



★★★★★
You Won't Be Disappointed
"I really like the quality of this product. It lays absolutely flat. Looks great on the garage floor. Holding up to high traffic, easy to clean."



INSIDE OF GARAGE GARAGE DOOR OUTSIDE OF GARAGE
SEAL CONCRETE

Complete Tsunami Seal® Kit
Seal the space between your garage and the world outside to keep your garage clean and dry

★★★★★
Perfect for what we needed
"Had an issue with rain water seeping under garage door. Installed, sealed outside edge & had a total of over 16 inches of rain - garage is DRY!!"

SAVE 20% NOW AT:
www.YourGaragePro.com | 800.992.2018

GARAGE PRO

Remarkable Leather Goods from Maine.



The Rogue Front Pocket Wallet in American Bison Leather. \$65.

At Rogue Industries, we craft remarkable leather goods that are built to last. From our solar powered workshop in Maine, we make some of the world's most comfortable wallets and lightweight bags, using sustainable American bison and Canadian moose leathers. Visit us online, or call for a catalogue today.

EST. **ROGUE INDUSTRIES** 2007
HANDCRAFTED LEATHER GOODS
ROGUE-INDUSTRIES.COM • 1-800-786-1768

ROADMONSTER



THE BOSS WAGON (IN C/D PARLANCE) IS ALIVE AND WELL IN A VERY UNLIKELY WAY WITH THE FINAL BUICK ROADMASTER.

An anachronism when new, the final Buick Roadmaster wagon (1991–96) arrived more than a decade into an era of downsized cars with understated exteriors. It sported skirted fenders, woodgrain paneling, and three rows of seats. When the Roadmaster and its B-platform siblings (the Chevrolet Caprice and the Oldsmobile Custom Cruiser) appeared, almost all new cars were unibody designs. GM's full-size wagons for '91 were body-on-frame dinosaurs, with V-8 power and rear-wheel drive—the ideal template for a sleeper muscle car.

The Roadmaster launched as a formal, old-school family hauler. “I think people respected the wagon, although it was a period when wagons were on their way out,” says Ed Welburn, who, before becoming head of General Motors global design, worked on GM's final rear-drive wagon. Early-'90s families were driving minivans and Ford Explorers. A station wagon was somewhat uncool, in both a school drop-off lane and a staging lane.

The Roadmaster's potential was evident to Martyn Schorr, whose agency handled East Coast public relations for the tri-shield brand during the era. “I managed the build of two Roadmasters for [Buick fanatic] Nicola Bulgari, with 502 crate motors,” Schorr says. These

cars, a sedan and a wagon that were the final versions of each body style, were customized by Specialized Vehicles Inc., a respected concept-car fabricator in suburban Detroit.

“Those were serious road warriors—complex, quick, and fast,” Schorr says. “Everything was custom, including the four-wheel Brembo disc brakes, fuel-injection systems for the 502s, custom wheels with cloisonné Buick emblems in the center caps, and NASCAR-type coolers for transmission, the engine, and the rear end.”

Schorr's builds were freaks at the time. But since then Welburn has seen the GM wagon transition into a modern hot-rod darling. “I noticed it a few years ago, the beginnings of it,” he says. Some friends from Bulgari's collection recently visited him, arriving in two modified Roadmasters. “It's an interesting phenomenon,” Welburn says. “It's hard for me to put ‘performance’ and that vehicle in the same sentence.”

Not every modified wagon suits his taste. “Some look ridiculous,” says Welburn, who prefers stock-looking sleepers with modestly upsized wheels for “a more balanced look.” But he's open to all modes of vehicular enthusiasm. Boss Wagons ho! —*Brett Berk*



TRANSPLANT RECIPIENT

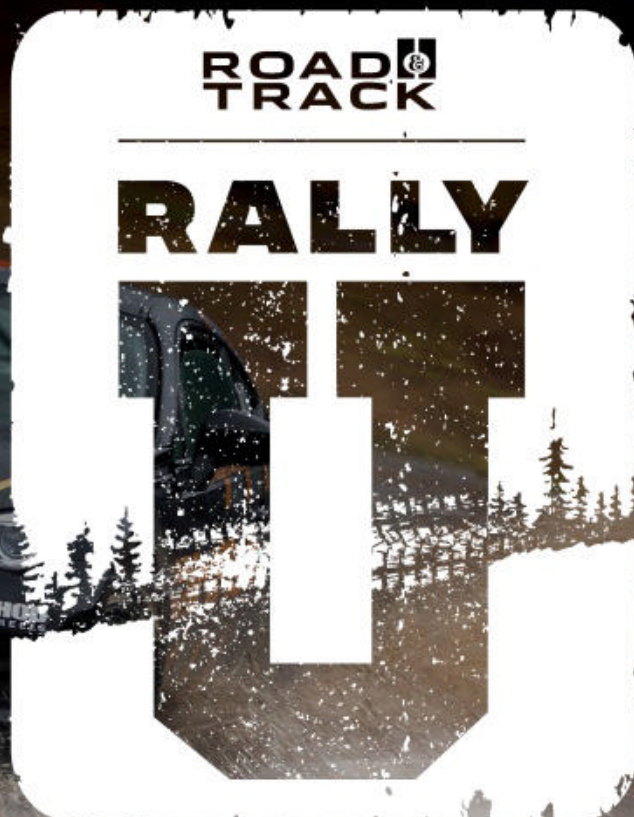
Automotive photographer and C/D contributor James Lipman sourced a GM E-Rod 6.2-liter V-8 crate engine from someone's misguided Ferrari 400i restomod project and dropped it into his 1992 Roadmaster wagon. “It's pretty much plug-and-play,” he says. “The four-page instructions essentially say: Put it in the car, connect the wiring, drive it.”



REMASTERED CLASSIC

While it started life as a Caprice wagon, racer Steve Morris's longroof has earned its Roadmaster stripes. After the Caprice scraped a wall in a race in 2010, “I decided to make it into a woodgrain station wagon,” he says. Under the hood bulge lives a custom twin-turbo 9.4-liter V-8. “It makes 4500 horsepower. We're trying to do a five-second quarter-mile.”

JOIN US AS WE ADVENTURE INTO WASHINGTON STATE'S RUGGED WILDERNESS.



JULY 15-16, 2022



YOU'LL ENJOY:

- // Views of volcanic peaks and the glistening Pacific will serve as backdrop for your adventure, including a drive along the state's scenic Highway 2.
- // Get sideways (and then some) at DirtFish, America's premier rally driving school, followed by a private tour of one of the finest rally car collections on earth.
- // Drive one of Washington's most dramatic mountain passes before pit-stopping in Leavenworth, a charming mountain town modeled after a Bavarian mountain village.
- // Revel in the Pacific Northwest's rustic and refined cuisine – wild-caught salmon, fresh foraged ingredients, locally distilled whiskeys, and Washington's world-class wines.



EXPERIENCES.ROADANDTRACK.COM/RALLYU

← OR SCAN HERE

DirtFish

Go where you're called.
Road or not.
The all-new Sportage X-Pro.



Movement that inspires

Introducing the all-new Kia Sportage X-Pro. It's so good, it just might inspire you to do some good with it. With multi-terrain AWD mode that intuitively adapts to whatever surface you're driving on, be it sand, snow, mud, and more. It'll take you wherever you're called.

2023 Sportage X-Pro Prestige shown with optional features. Some features may vary. No system, no matter how advanced, can compensate for all driver error and/or driving conditions. Always drive safely. Available spring 2022.

Coming Soon